Base Load Power Hub (BLPH)

TECHNICAL INTEGRITY VERIFICATION REPORTS COLLECTION

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Document Class: 2

01	15/05/2025	Accepted for Construction	M.Patanè	R.DegliEsposti	C.Giunchi
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Rev.	Date	Description	Prepared	Reviewed	Approved

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Revision / Change Log

Rev.	Description
00	Issue for Review (IFR)
01	Comments implemented and added revision 02 of the TIVR's

HOLDS LIST

No.	Description
1	
2	
3	
4	

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

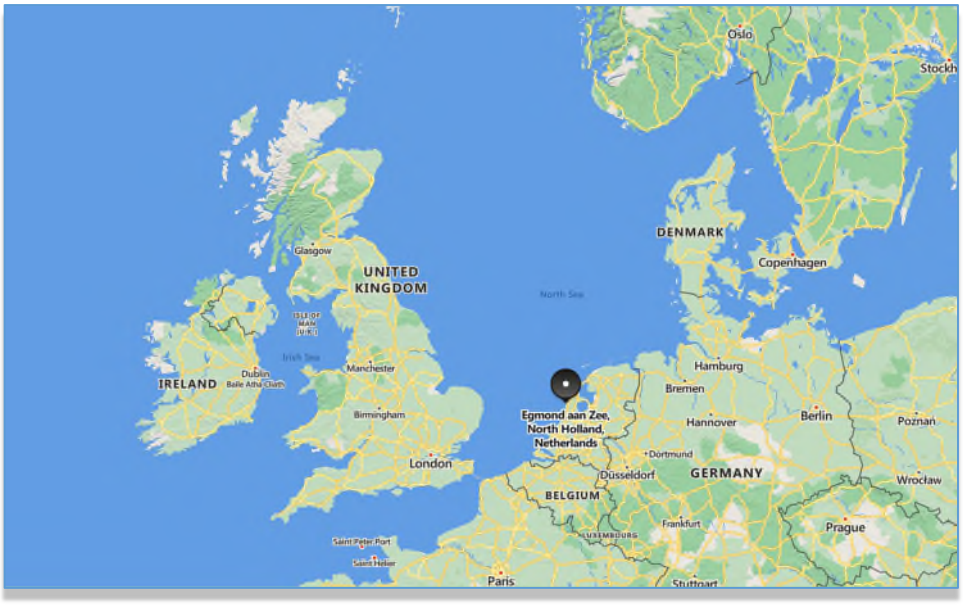


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map

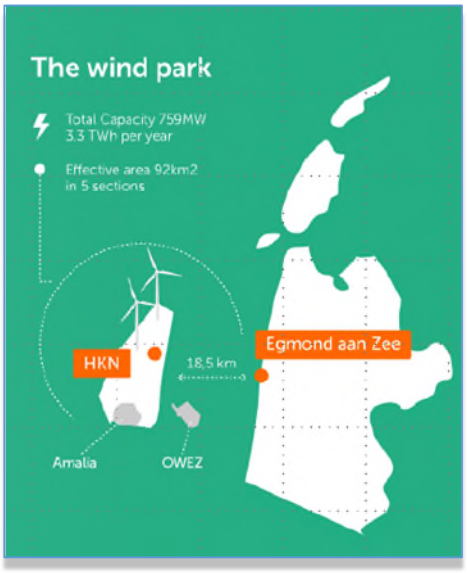


Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

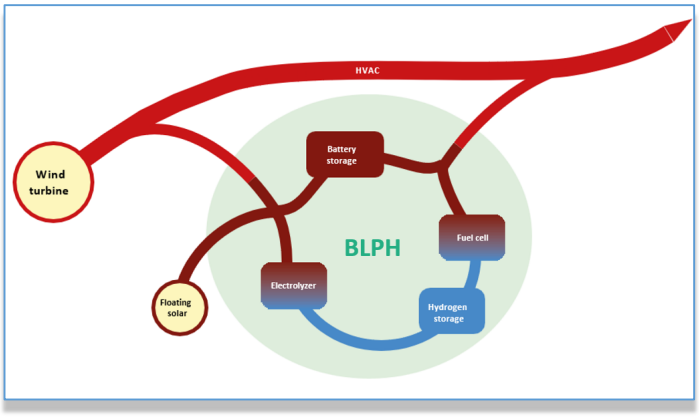


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

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2 DOCUMENT SCOPE

This document is intended to be a comprehensive collection of all Technical Integrity Verification Reports (TIVRs) issued for the project.

It is the formal evidence that all Technical Integrity Verification activities have been performed in compliance with the applicable project requirements.

Furthermore, the document is intended to be a tool for tracking and monitoring the status of each TIVR.

As such, it shall be considered a living document, subject to revisions that will reflect the progressive closure of open actions and the completion of the verification process.

Revisions will continue to be issued until all TIVRs have been finalized and all related actions are formally closed.

3 REFERENCE DOCUMENTS

Document Code	Document Title
123A90-DDL-MD-LIS-01010	PERFORMANCE STANDARD COLLECTION
123A90-DDL-SAF-RE-30003	SCE IDENTIFICATION
123A90-PML-QHSE-LIS-00065	TECHNICAL INTEGRITY VERIFICATION (TIV) PROGRAMME
123A90-PML-QHSE-RE-00064	SECE-DEM1-DEM2 COMPLIANCE REPORT
K559-2254-QM-PLN-001	TECHNICAL INTEGRITY VERIFICATION PLAN
K559-2254-SE-REP-018	SECE IDENTIFICATION
CONTRACT SECTION IX	QUALITY MANAGEMENT
CONTRACT SECTION X	TECHNICAL INFORMATION
CONTRACT SECTION V	SCOPE DESCRIPTION

4 ABBREVIATIONS

TIVR	Technical Integrity Verification Report

5 TIVR LIST AND STATUS

REF.	NUMBER	DESCRIPTION	REV.	DATE	STATUS
1	ER001-01	Muster Area	02	15/05/2025	CPY Comments implemented
2	ER002-01	Emergency / Escape Lighting	02	15/05/2025	CPY Comments implemented
3	ER003-01	Emergency / Escape Routes	02	15/05/2025	CPY Comments implemented
4	ER004-01	Emergency Communication System	02	15/05/2025	CPY Comments implemented
5	DS001-01	F&G Detection System	02	15/05/2025	CPY Comments implemented
6	ER005-01	Uninterruptible Power System (UPS)	02	15/05/2025	CPY Comments implemented
7	IC001-01	Hazardous Area Ventilation	02	15/05/2025	CPY Comments implemented
8	IC003-01	Certified (ex-rated) Electrical Equipment	02	15/05/2025	CPY Comments implemented
9	IC005-01	Electrical Earthing Continuity and Earth Bonding	02	15/05/2025	CPY Comments implemented
10	IC007-01	Inert Gas Blanket System	02	15/05/2025	CPY Comments implemented
11	LS001-01	Personal Survival Equipment (PSE)	02	15/05/2025	CPY Comments implemented
12	LS002-01	Alternate Means of Escape	02	15/05/2025	CPY Comments implemented
13	PC001-01	Pressure Vessels	02	15/05/2025	CPY Comments implemented
14	PC005-01	Piping System	02	15/05/2025	CPY Comments implemented
15	PC007-01	Relief System	02	15/05/2025	CPY Comments implemented
16	PS002-01	Fire and Explosion Protection	02	15/05/2025	CPY Comments implemented
17	PS015-01	Collision Avoidance System	02	15/05/2025	CPY Comments implemented
18	SD001-01	Emergency Shutdown System (ESD)	02	15/05/2025	CPY Comments implemented
19	SD002-01	Blowdown Valves (BDV)	02	15/05/2025	CPY Comments implemented
20	SD006-01	Emergency Shutdown Valves (SDV)	02	15/05/2025	CPY Comments implemented
21	SD009-01	Utility Air	02	15/05/2025	CPY Comments implemented
22	SI002-01	Topside Structure	02	15/05/2025	CPY Comments implemented

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6 TIV REPORTS

TECHNICAL INTEGRITY VERIFICATION REPORT ER001-01-Rev.02

Client: **Crosswind**

Project: **HOLLANDSE KUST NOORD WIND PARK Project - Contract No. CW-I-WP4-2023-05**

Installation: **Base Load Power Hub (BLPH)**

SCE Performance Standard

Reference document: Safety Critical Elements (SCE) and Performance Standard Doc. No. 123A90-DDL-SAF-RE-30003 Rev.04

SCE Description: MUSTER AREA **SCE ID**: ER001

SCE TAG	DESCRIPTION	SCE CODE
BLPH-PRIMARY MUSTER AREA	PRIMARY MUSTER AREA	ER001-BLPH- PRIMARY MUSTER AREA
BLPH-SECONDARY MUSTER AREA	SECONDARY MUSTER AREA	ER001-BLPH- SECONDARY MUSTER AREA

SCE Boundaries: Escape Evacuation **SCE Functionality Criteria**: To ensure the emergency to be assessed and to allow the appropriate parts of the emergency response plan to be executed during a major accident event

PHASE: Design / Procurement / Fabrication / Construction / Commissioning

Performance Standard: ER001-01

Criteria **Description**

The criteria selected for design, procurement, fabrication, construction, and commissioning are based on projects and safety technical standards, industry best practices, and regulatory requirements. These ensure the platform's safety, reliability, and compliance at every stage, focusing on quality, integrity, and performance across the project lifecycle.

Detailed criteria are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

Technical Integrity Verification Activities

Activity **Details**

Assurance is the processes that ensures a consistent meet of the performance criteria. It involves checks, audits, and monitoring to verify that operations remain within required parameters, identifying and mitigating risks to maintain safety and efficiency.

Detailed assurance activities are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

A = Activity closed, it has been demonstrated that the performance standard has been met.

B = Activity undertaken, comments outstanding performance standard has not been met.

B* = Activity is not in compliance with Performance Standard. A documented review of the technical solution has been completed by Duty Holder/Owner, and the review has concluded that the current solution is acceptable and has an equivalent level of safety. No further action is required by Verifier.

C = Activity cannot be completed, further information required, see comments below.

Phase	Assurance	Status
Design	Review layout drawings to confirm that the Muster Area boundaries are specified to enclose and effectively protect	
Proc.	N/A	
Fabr.	N/A	
Const.	Mechanical completion checks and compilation of related ITRs	
Comm.	N/A	

Tags

Rosetti has performed the above-listed verification activities, which apply to the platform

TECHNICAL INTEGRITY VERIFICATION REPORT ER001-01-Rev.02

Documents Reviewed

Document No.	Title	Rev.
123A90-DDL-SAF-DL-30025	Escape Routes, Fire Fighting, Life Saving Equipment and Safety Equipment Layouts Drawings	01
123A90-DDL-SAF-DL-30026	Escape Routes, Fire Fighting, Life Saving Equipment and Safety Equipment Layouts Drawings - upper deck	03
123A90-DDL-SAF-DL-30029	Safety signs equipment layout drawings	01
123A90-DDL-SAF-DS-30043	Safety Sign Specifications and Datasheets	02

Outstanding Issues / Comments

Verification

There are no deviations from code, standards or specified requirements identified.

REV.	Date Issued	Issued by [PQM]	Verified by [PEM]	Approved by [PM]
00	11/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
01	26/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
02	15/05/2025	Raffaele Degli Esposti	Claudia Giunchi	Massimiliano Brunelli

TECHNICAL INTEGRITY VERIFICATION REPORT ER002-01-Rev.02

Client: **Crosswind**

Project: **HOLLANDSE KUST NOORD WIND PARK Project - Contract No. CW-I-WP4-2023-05**

Installation: **Base Load Power Hub (BLPH)**

SCE Performance Standard

Reference document: Safety Critical Elements (SCE) and Performance Standard Doc. No. 123A90-DDL-SAF-RE-30003 Rev.04

SCE Description: Escape Routes **SCE ID**: ER002

SCE TAG	DESCRIPTION	SCE CODE
BLPH- PRIMARY ESCAPE ROUTES	PRIMARY ESCAPE ROUTES	ER002-BLPH- PRIMARY ESCAPE ROUTES
BLPH- SECONDARY ESCAPE ROUTES	SECONDARY ESCAPE ROUTES	ER002-BLPH- SECONDARY ESCAPE ROUTES

SCE Boundaries: Escape Routes **SCE Functionality Criteria**: To provide sufficient escape routes safe and readily identifiable for all personnel to leave an area affected by an incident, reach the muster area from any part of the platform and transfer from the muster area to the evacuation and embarkation points

PHASE: Design / Procurement / Fabrication / Construction / Commissioning

Performance Standard: ER002-01

Criteria Description

The criteria selected for design, procurement, fabrication, construction, and commissioning are based on projects and safety technical standards, industry best practices, and regulatory requirements. These ensure the platform's safety, reliability, and compliance at every stage, focusing on quality, integrity, and performance across the project lifecycle.

Detailed criterias are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 rev.00

Technical Integrity Verification Activities

Activity Details

Assurance is the processes that ensures a consistent meet of the performance criteria. It involves checks, audits, and monitoring to verify that operations remain within required parameters, identifying and mitigating risks to maintain safety and efficiency.

Detailed assurance activities are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

A = Activity closed, it has been demonstrated that the performance standard has been met.

B = Activity undertaken, comments outstanding performance standard has not been met.

B* = Activity is not in compliance with Performance Standard. A documented review of the technical solution has been completed by Duty Holder/Owner, and the review has concluded that the current solution is acceptable and has an equivalent level of safety. No further action is required by Verifier.

C = Activity cannot be completed, further information required, see comments below.

Phase	Assurance	Status
Design	Review layout drawings to confirm that the Muster Area boundaries are specified to enclose and effectively protect	
	Company review and approval of the design documents are aligned with project requirements	
Proc.	N/A	
Fabr.	N/A	
Const.	Mechanical completion checks and compilation of related ITRs	
Comm.	N/A	

Tags

Rosetti has performed the above-listed verification activities, which apply to the platform

TECHNICAL INTEGRITY VERIFICATION REPORT ER002-01-Rev.02

Documents Reviewed

Document No.	Title	Rev.
123A90-DDL-SAF-DL-30025	Escape Routes, Fire Fighting, Life Saving Equipment and Safety Equipment Layouts Drawings	01
123A90-DDL-SAF-DL-30026	Escape Routes, Fire Fighting, Life Saving Equipment and Safety Equipment Layouts Drawings - upper deck	03
123A90-DDL-SAF-DL-30029	Safety signs equipment layout drawings	01
123A90-DDL-SAF-DS-30043	Safety Sign Specifications and Datasheets	02

Outstanding Issues / Comments

NONE

Verification

There are no deviations from code, standards or specified requirements identified.

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00	11/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
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02	15/05/2025	Raffaele Degli Esposti	Claudia Giunchi	Massimiliano Brunelli

TECHNICAL INTEGRITY VERIFICATION REPORT ER004-01-Rev.02

Client: **Crosswind**

Project: **HOLLANDSE KUST NOORD WIND PARK Project - Contract No. CW-I-WP4-2023-05**

Installation: **Base Load Power Hub (BLPH)**

SCE Performance Standard

Reference document: Safety Critical Elements (SCE) and Performance Standard Doc. No. 123A90-DDL-SAF-RE-30003 Rev.04

SCE Description: Emergency / Escape Lighting **SCE ID**: ER004

SCE TAG	DESCRIPTION	SCE CODE
BLPH- EM LIGHTING PANEL	EMERGENCY LIGHTING PANEL	ER003-BLPH- EM LIGHTING PANEL
BLPH-EMERGENCY LIGHTS	EMERGENCY LIGHTS	ER003-BLPH-EMERGENCY LIGHTS

SCE Boundaries: Emergency Lighting **SCE Functionality Criteria**: To provide adequate illumination at emergency response locations and escape routes in the event of a major accident event.

PHASE: Design / Procurement / Fabrication / Construction / Commissioning

Performance Standard: ER004-01

Criteria Description

The criteria selected for design, procurement, fabrication, construction, and commissioning are based on projects and safety technical standards, industry best practices, and regulatory requirements. These ensure the platform's safety, reliability, and compliance at every stage, focusing on quality, integrity, and performance across the project lifecycle.

Detailed criteria are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010-Rev.00

Technical Integrity Verification Activities

Activity Details

Assurance is the processes that ensures a consistent meet of the performance criteria. It involves checks, audits, and monitoring to verify that operations remain within required parameters, identifying and mitigating risks to maintain safety and efficiency.

Detailed assurance activities are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

A = Activity closed, it has been demonstrated that the performance standard has been met.

B = Activity undertaken, comments outstanding performance standard has not been met.

B* = Activity is not in compliance with Performance Standard. A documented review of the technical solution has been completed by Duty Holder/Owner, and the review has concluded that the current solution is acceptable and has an equivalent level of safety. No further action is required by Verifier.

C = Activity cannot be completed, further information required, see comments below.

Phase	Assurance	Status
Design	Review lighting layouts in conjunction with lighting calculations and escape route layout drawings to confirm that the emergency lighting layout specified is appropriate	
	Company review and approval of the design documents are aligned with project requirements	
Proc.	Vendor's Declaration of Conformity to ATEX Vendor's ATEX EC Examination Certification	
	Verify that the material requisition and the technical bid evaluation are attached to the purchase order Suppliers Declaration of Conformity	
Fabr.	N/A	
Const.	Mechanical completion checks and compilation of related ITRs	
Comm.	Witnessing of the Site Acceptance test by a suitable qualified inspector and issuance of commissioning reports	

Tags

Rosetti has performed the above-listed verification activities, which apply to the platform

TECHNICAL INTEGRITY VERIFICATION REPORT ER004-01-Rev.02

Documents Reviewed

Document No.	Title	Rev.
123A90-DDL-EL-DL-20118	Base Load Power Hub - Lighting & Socket Layout - Top Deck	01
123A90-DDL-EL-DL-20119	Base Load Power Hub - Lighting and Socket Layout - Lower Deck	01
123A90-DDL-EL-DL-20120	Base Load Power HUB (BLPH) Lighting & Socket Layout - Below Lower deck	02
123A90-DDL-EL-DL-20122	Base Load Power Hub (BLPH) - Lighting & Socket Layout - HV Switchroom	01
123A90-DDL-EL-DL-20123	Base Load Power Hub (BLPH) - Lighting and Socket Layout - LV Switchroom	01
123A90-DDL-EL-RE-20153	Lighting Calculation Study Report	01

Outstanding Issues / Comments

NONE

Verification

There are no deviations from code, standards or specified requirements identified.

REV.	Date Issued	Issued by [PQM]	Verified by [PEM]	Approved by [PM]
00	11/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
01	26/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
02	15/05/2025	Raffaele Degli Esposti	Claudia Giunchi	Massimiliano Brunelli

TECHNICAL INTEGRITY VERIFICATION REPORT SD001-01- Rev.02

Client: **Crosswind**

Project: **HOLLANDSE KUST NOORD WIND PARK Project - Contract No. CW-I-WP4-2023-05**

Installation: **Base Load Power Hub (BLPH)**

SCE Performance Standard

Reference document: Safety Critical Elements (SCE) and Performance Standard Doc. No. 123A90-DDL-SAF-RE-30003 Rev.04

SCE Description: Emergency shutdown system (ESD) **SCE ID**: SD001

SCE TAG	DESCRIPTION	SCE CODE
Refer to the attached table	Refer to the attached table	Refer to the attached table

SCE Boundaries: Safety control loop including the transmitter with sensor for parameter (pressure, temperature, level) and logic solver (interlock, analogical or digital input/output modules, interposing relay, pulse barrier)

SCE Functionality Criteria: To ensure platform shutdown in safe conditions

PHASE: Design / Procurement / Fabrication / Construction / Commissioning

Performance Standard: SD001-01

Criteria Description

The criteria selected for design, procurement, fabrication, construction, and commissioning are based on projects and safety technical standards, industry best practices, and regulatory requirements. These ensure the platform's safety, reliability, and compliance at every stage, focusing on quality, integrity, and performance across the project lifecycle.

Detailed criterias are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

Technical Integrity Verification Activities

Activity Details

Assurance is the processes that ensures a consistent meet of the performance criteria. It involves checks, audits, and monitoring to verify that operations remain within required parameters, identifying and mitigating risks to maintain safety and efficiency.

Detailed assurance activities are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

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B* = Activity is not in compliance with Performance Standard. A documented review of the technical solution has been completed by Duty Holder/Owner, and the review has concluded that the current solution is acceptable and has an equivalent level of safety. No further action is required by Verifier.

C = Activity cannot be completed, further information required, see comments below.

Phase	Assurance	Status
Design	Basic Design Engineering Package	
	Company Verify and approve the design.	
	Company review and approval of the design documents are aligned with project requirements	
Proc.	Verify that the material requisition and the technical bid evaluation are attached to the purchase order Suppliers Declaration of Conformity	
	Perform audits based on the criticality rating of the supply and new suppliers.	
Fabr.	N/A	
Const.	Mechancial completion checks and compilation of related ITRs	
Comm.	Witnessing of the Site Acceptance test by suitable qualified inspector and issuance of commissioning reports	

TECHNICAL INTEGRITY VERIFICATION REPORT SD001-01- Rev.02

Documents Reviewed

Document No.	Title	Rev.
1724000204-IN-CA-00003	ACTUATOR SIZING AND TORQUE TABLE	05
1724000204-MAT-PRO-00008	ACTUATOR SURFACE PREPARATION AND PAINTING PROCEDURES	02
1724000204-IN-LIS-00013	ATEX REGISTER	02
1724000204-QC-PRO-00010	FACTORY ACCEPTANCE TEST PROCEDURE AND REPORT	01
1724000204-QC-ITP-00002	INSPECTION AND TEST PLAN	02
1724000204-IN-DS-00007	INSTRUMENT AND VALVES DATA SHEETS	01
1724000204-IN-DG-00006	PNEUMATIC DIAGRAM and WIRING	03
1724000204-QC-PRO-00016	PREPARATION FOR SHIPPING WITH HANDLING AND STORAGE PROCEDURES	00
1724000204-QC-LIS-00012	SDV - BDV AND TIGHT SHUT-OFF XV VALVES - MANUFACTURERS RECORD BOOK (FINAL DOSSIER) - INDEX	01
1724000204-IN-MAN-00014	SDV - BDV AND TIGHT SHUT-OFF XV VALVES - TECHNICAL OPERATING AND MAINTENANCE MANUAL – COMPLETE	01
1724000204-QC-DB-00011	SDV- BDV AND TIGHT SHUT-OFF XV VALVES - MANUFACTURERS RECORD BOOK (FINAL DOSSIER)	00
1724000204-COM-LIS-00015	SPARE PART AND SPECIAL TOOLS INDEX REGISTER (COMMISSIONING, 2-YEARs OPERATION)	01
1724000204-MD-LIS-00001	SUPPLIER MASTER INDEX REGISTER (SMIR)	02
1724000204-IN-DA-00004	VALVE, ACTUATOR AND ASSEMBLY GENERAL ARRANGEMENTS DRAWING AND NAMEPLATE DRAWING	04
1724000204-MAT-PRO-00009	VALVES SURFACE PREPARATION AND PAINTING PROCEDURES	02

Tags

Rosetti has performed the above-listed verification activities, which apply to the platform

Outstanding Issues / Comments

NONE

Verification

There are no deviations from code, standards or specified requirements identified.

REV.	Date Issued	Issued by [PQM]	Verified by [PEM]	Approved by [PM]
00	11/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
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02	15/05/2025	Raffaele Degli Esposti	Claudia Giunchi	Massimiliano Brunelli

SD001 EMERGENCY SHUTDOWN SYSTEM				
25-PT-002	25-PT-002 LOCATED ON COMMON LINE TO STORAGE VESSELS	SD001	SD001-25-PT-002	
25-PT-004	25-PT-004 LOCATED ON STORAGE VESSEL V-25001A	SD001	SD001-25-PT-004	
25-PT-006	25-PT-006 LOCATED ON STORAGE VESSEL V-25001B	SD001	SD001-25-PT-006	
25-PT-008	25-PT-008 LOCATED ON STORAGE VESSEL V-25001C	SD001	SD001-25-PT-008	
25-PT-009	25-PT-009 LOCATED ON STORAGE VESSEL V-25001D	SD001	SD001-25-PT-009	
25-PT-011	25-PT-011 LOCATED ON STORAGE VESSEL V-25001E	SD001	SD001-25-PT-011	
25-PT-012	25-PT-012 LOCATED ON STORAGE VESSEL V-25001F	SD001	SD001-25-PT-012	
80-PT-002	80-PT-002 LOCATED ON COMMON LINE TO FUEL CELL PACKAGE	SD001	SD001-80-PT-002	
950ESD-01101	ESD-1 PUSH BUTTON, EXTERNAL AREA OF FUEL CELL, UPPER DECK	SD001	SD001-950ESD-01101	
950ESDD-01101	ESD-1D PUSH BUTTON, EXTERNAL AREA OF FUEL CELL, UPPER DECK	SD001	SD001-950ESDD-01101	
950ESD-03101	ESD-1 PUSH BUTTON, EXTERNAL AREA OF UV WATER FILTER, UPPER DECK	SD001	SD001-950ESD-03101	
950ESDD-03101	ESD-1D PUSH BUTTON, EXTERNAL AREA OF UV WATER FILTER, UPPER DECK	SD001	SD001-950ESDD-03101	
950ESD-06101	ESD-1 PUSH BUTTON, EXTERNAL AREA OF B-100 HV/MV SWITCHROOM, LOWER DECK	SD001	SD001-950ESD-06101	
950ESDD-06101	ESD-1D PUSH BUTTON, EXTERNAL AREA OF B-100 HV/MV SWITCHROOM, LOWER DECK	SD001	SD001-950ESDD-06101	
950ESD-04101	ESD-1 PUSH BUTTON, EXTERNAL AREA OF B-400 I&T ROOM, LOWER DECK	SD001	SD001-950ESD-04101	
950ESDD-04101	ESD-1D PUSH BUTTON, EXTERNAL AREA OF B-400 I&T ROOM, LOWER DECK	SD001	SD001-950ESDD-04101	
950ESD-07101	ESD-1 PUSH BUTTON, WASTE WATER TANK AREA, EXISTING PLATFORM	SD001	SD001-950ESD-07101	
950ESDD-07101	ESD-1D PUSH BUTTON, WASTE WATER TANK AREA, EXISTING PLATFORM	SD001	SD001-950ESDD-07101	

TECHNICAL INTEGRITY VERIFICATION REPORT ER005-01-Rev.02

Client: **Crosswind**

Project: **HOLLANDSE KUST NOORD WIND PARK Project - Contract No. CW-I-WP4-2023-05**

Installation: **Base Load Power Hub (BLPH)**

SCE Performance Standard

Reference document: Safety Critical Elements (SCE) and Performance Standard — Doc. No. 123A90-DDL-SAF-RE-30003-Rev.04

SCE Description: Un-interruptible Power System (UPS) — **SCE ID**: ER005

SCE TAG	DESCRIPTION	SCE CODE
BLPH-AC UPS B-300	AC UPS SYSTEM B-300	ER005-BLPH-AC UPS B-300
BLPH-DC UPS	DC UPS SYSTEM	ER005-BLPH-DC UPS

SCE Boundaries: AC / DC UPS

SCE Functionality Criteria: To provide an uninterrupted power supply to the vital services of the facility during a Major Accident Event when normal power fails.

PHASE: Design / Procurement / Fabrication / Construction / Commissioning

Performance Standard: ER005-01

Criteria Description

The criteria selected for design, procurement, fabrication, construction, and commissioning are based on projects and safety technical standards, industry best practices, and regulatory requirements. These ensure the platform's safety, reliability, and compliance at every stage, focusing on quality, integrity, and performance across the project lifecycle.

Detailed criteria are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

Technical Integrity Verification Activities

Activity Details

Assurance is the processes that ensures a consistent meet of the performance criteria. It involves checks, audits, and monitoring to verify that operations remain within required parameters, identifying and mitigating risks to maintain safety and efficiency.

Detailed assurance activities are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

A = Activity closed, it has been demonstrated that the performance standard has been met.

B = Activity undertaken, comments outstanding performance standard has not been met.

B* = Activity is not in compliance with Performance Standard. A documented review of the technical solution has been completed by Duty Holder/Owner, and the review has concluded that the current solution is acceptable and has an equivalent level of safety. No further action is required by Verifier.

C = Activity cannot be completed, further information required, see comments below.

Phase	Assurance	Status
Design	Basic Design Engineering Package	
	UPS system equipment shall be designed and manufactured in accordance with the EMC directive 2014/30/EU.	
	Company review and approval of the design documents are aligned with project requirements	
Proc.	Verify and review the documentation provided Suppliers Declaration of Conformity	
Fabr.	Witnessing of the Factory Acceptance test by suitable qualified inspector	
	Review and approve Manufacturer Record Book	
Const.	Mechancial completion checks and compilation of related ITRs	
Comm.	Witnessing of the Site Acceptance test by suitable qualified inspector and issuance of commissioning reports	

Tags

Rosetti has performed the above-listed verification activities, which apply to the platform

Documents Reviewed

Document No.	Title	Rev.
K559-2254-PM-PLN-003	Basic Design Engineering Package	

TECHNICAL INTEGRITY VERIFICATION REPORT ER005-01-Rev.02

Documents Reviewed

Document No.	Title	Rev.
123A90-PML-COM-PRO-03050	OTP - DC UPS System 10kVA UP-200F1	02
123A90-PML-COM-PRO-03059	OTP - UPS System UP-200F3 35kVA	02
123A90-PML-COM-PRO-03060	OTP - AC UPS System 15kVA UP-200F4	02
123A90-DDL-AR-SP-10021	Supply Specification for AC UPS fitted with UPS system Equipment Room B-300	01
123A90-DDL-AR-DL-10022	BASE LOAD POWER HUB (LBPH) - AC UPS fitted with UPS system Equipment Room B-300 - ARCHITECTURAL GENERAL LAYOUT - PLAN, VIEW, SECT. AND TYP. DET	01
123A90-DDL-AR-MR-10026	MR - AC UPS fitted with UPS system Equipment Room B-300	00
123A90-DDL-EL-MR-20030	MR - AC UPS Systems	01
123A90-DDL-EL-SP-20031	Technical Specification, IDS and DDS for AC UPS Systems	02
123A90-DDL-EL-DL-20106	Base Load Power Hub (BLPH) - Electrical Equipment Layout - UPSs & Batteries Switchroom	01
123A90-DDL-EL-DL-20113	BASE LOAD POWER HUB (BLPH) - Electrical Cable Routing Layout - UPSs & Batteries Switchroom	01
123A90-DDL-EL-DL-20124	Base Load Power Hub (BLPH) - Lighting & Socket Layout - UPSs & Batteries Switchroom	01
123A90-DDL-EL-DL-20138	BASE LOAD POWER HUB (BLPH) - Earthing & Lightning Layout - UPSs & Batteries Switchroom	01
123A90-DDL-EL-RE-20155	UPS & Battery Sizing Calculations	01
123A90-DDL-EL-DG-20163	BASE LOAD POWER HUB (BLPH) - Electrical Typical Schematic Diagrams (Distribution Boards, AC UPS, DC UPS, etc)	01

Outstanding Issues / Comments

NONE

Verification

There are no deviations from code, standards or specified requirements identified.

REV.	Date Issued	Issued by [PQM]	Verified by [PEM]	Approved by [PM]
00	11/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
01	26/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
02	15/05/2025	Raffaele Degli Esposti	Claudia Giunchi	Massimiliano Brunelli

TECHNICAL INTEGRITY VERIFICATION REPORT IC001-01_REV.02

Client: **Crosswind**

Project: **HOLLANDSE KUST NOORD WIND PARK Project - Contract No. CW-I-WP4-2023-05**

Installation: **Base Load Power Hub (BLPH)**

SCE Performance Standard

Reference document: Safety Critical Elements (SCE) and Performance Standard Doc. No. 123A90-DDL-SAF-RE-30003 rev.04

SCE Description: Hazardous Area Ventilation **SCE ID**: IC001

SCE TAG	DESCRIPTION	SCE CODE
BLPH-EXTRACTION FANS in A-8500	EXTRACTION FANS IN BESS PACKAGE A-8500	IC002-BLPH-EXTRACTION FANS in A-8500

SCE Boundaries: Ventilation Systems in Hazardous Area

SCE Functionality Criteria: To prevent the formation of potentially hazardous concentration of flammable and/or toxic gas mixtures in hazardous areas by providing adequate ventilation to dilute, disperse and remove such mixtures to a suitable location.

PHASE: Design / Procurement / Fabrication / Construction / Commissioning

Performance Standard: IC001-01

Criteria **Description**

The criteria selected for design, procurement, fabrication, construction, and commissioning are based on projects and safety technical standards, industry best practices, and regulatory requirements. These ensure the platform's safety, reliability, and compliance at every stage, focusing on quality, integrity, and performance across the project lifecycle.

Detailed criterias are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

Technical Integrity Verification Activities

Activity **Details**

Assurance is the processes that ensures a consistent meet of the performance criteria. It involves checks, audits, and monitoring to verify that operations remain within required parameters, identifying and mitigating risks to maintain safety and efficiency.

Detailed assurance activities are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

A = Activity closed, it has been demonstrated that the performance standard has been met.

B = Activity undertaken, comments outstanding performance standard has not been met.

B* = Activity is not in compliance with Performance Standard. A documented review of the technical solution has been completed by Duty Holder/Owner, and the review has concluded that the current solution is acceptable and has an equivalent level of safety. No further action is required by Verifier.

C = Activity cannot be completed, further information required, see comments below.

Phase	Assurance	Status
Design	Layout based on natural ventiliation of open areas	
	Hazard Area Classification	
	Company review and approval of the design documents are aligned with project requirements (HVAC on under/over pressure)	
	Company review and approval of the design documents are aligned with project requirements (Areas identified in datasheet)	
	Company review and approval of the design documents are aligned with project requirements (loss of pressurization)	
	Layout based on natural ventiliation of open areas	
Proc.	Verify that the material requisition and the technical bid evaluation are attached to the purchase order	
	Perform audits based on the criticality rating of the supply and new suppliers.	
Fabr.	Witnessing of the Factory Acceptance test by suitable qualified inspector according EEHA	
	Review and approve Manufacturer Record Book	
Const.	Ready For Commissioning Certificate issued	
Comm.	Witnessing of the Site Acceptance test by suitable qualified inspector according EEHA and issuance of commissioning reports	

TECHNICAL INTEGRITY VERIFICATION REPORT IC001-01_REV.02

Tags

Rosetti has performed the above-listed verification activities, which apply to the platform

Documents Reviewed

Document No.	Title	Rev.
123A90-DDL-SAF-DL-30024	Hazardous Area Classification - Elevation looking North and East	03
123A90-DDL-SAF-DL-30022	Hazardous Area Classification - Lower deck & Upper deck	03
123A90-DDL-SAF-RE-30013	Hazardous Area Classification Schedule	05
123A90-DDL-SAF-LIS-30000	Hazardous Material Register and Inventory	03

Outstanding Issues / Comments

NONE

Verification

There are no deviations from code, standards or specified requirements identified.

REV.	Date Issued	Issued by [PQM]	Verified by [PEM]	Approved by [PM]
00	11/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
01	26/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
02	15/05/2025	Raffaele Degli Esposti	Claudia Giunchi	Massimiliano Brunelli

TECHNICAL INTEGRITY VERIFICATION REPORT IC003-01-Rev.02

Client: **Crosswind**

Project: **HOLLANDSE KUST NOORD WIND PARK Project - Contract No. CW-I-WP4-2023-05**

Installation: **Base Load Power Hub (BLPH)**

SCE Performance Standard

Reference document: Safety Critical Elements (SCE) and Performance Standard — Doc. No. 123A90-DDL-SAF-RE-30003 — Rev.04

SCE Description: Certified (Ex-rated) Electrical Equipment

SCE ID: IC003

SCE TAG	DESCRIPTION	SCE CODE
Refer to the attached table	Refer to the attached table	Refer to the attached table

SCE Boundaries: Electrical Equipment, Instrumentation

SCE Functionality Criteria: No ignition source formation probability inside the concerned hazardous area (Ex-d, Ex-e, Ex-n equipment apparatus).

PHASE: Design / Procurement / Fabrication / Construction / Commissioning

Performance Standard: IC003-01

Criteria

The criteria selected for design, procurement, fabrication, construction, and commissioning are based on projects and safety technical standards, industry best practices, and regulatory requirements. These ensure the platform's safety, reliability, and compliance at every stage, focusing on quality, integrity, and performance across the project lifecycle.

Detailed criterias are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

Technical Integrity Verification Activities

Activity **Details**

Assurance is the processes that ensures a consistent meet of the performance criteria. It involves checks, audits, and monitoring to verify that operations remain within required parameters, identifying and mitigating risks to maintain safety and efficiency.

Detailed assurance activities are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

A = Activity closed, it has been demonstrated that the performance standard has been met.

B = Activity undertaken, comments outstanding performance standard has not been met.

B* = Activity is not in compliance with Performance Standard. A documented review of the technical solution has been completed by Duty Holder/Owner, and the review has concluded that the current solution is acceptable and has an equivalent level of safety. No further action is required by Verifier.

C = Activity cannot be completed, further information required, see comments below.

Phase	Assurance	Status
Design	Hazardous Area Classification	
	ATEX 2014/34/UE	
	Company Verify and approve the design.	
	Company review and approval of the design documents by suitable qualified personnel according EEHA	
	Compliance of the vendor to the material requisition by preparing a technical bid evaluation.	
	Company review and approval of the design documents are aligned with project requirements	
Proc.	Verify that the material requisition and the technical bid evaluation are attached to the purchase order / Suppliers Declaration of Conformity	
	Vendor's Declaration of Conformity to ATEX Vendor's ATEX EC Examination Certification	
	Perform audits based on the criticality rating of the supply and new suppliers.	
Fabr.	Verify the material certificates.	
	Verify completion of ATEX register	
	Witnessing of the Factory Acceptance test by suitable qualified inspector according EEHA	
	Review and approve Manufacturer Record Book	
Constr.	Ready For Commissioning Certificate issued	

	Ensure ATEX apparatus has been installed in accordance to manufacturers instructions and the Special conditions for Use on ATEX certificates have been met during installation.	
	Carry out Detailed Inspections of all ATEX apparatus in accordance with IEC60079.17 by suitably qualified inspector according to EEHA.	
Comm.	Compliance to OTPs.	
Comm.	Witnessing of the Site Acceptance test by suitable qualified inspector according EEHA and issuance of commissioning reports	

Tags

Rosetti has performed the above-listed verification activities, which apply to the certified equipment portion of the platform.

Documents Reviewed

Document No.	Title	Rev.
SUPPLIER: FLUITEK – PO: 1724000204		
1724000204-IN-CA-00003	ACTUATOR SIZING AND TORQUE TABLE	05
1724000204-MAT-PRO-00008	ACTUATOR SURFACE PREPARATION AND PAINTING PROCEDURES	02
1724000204-IN-LIS-00013	ATEX REGISTER	02
1724000204-QC-PRO-00010	FACTORY ACCEPTANCE TEST PROCEDURE AND REPORT	01
1724000204-QC-ITP-00002	INSPECTION AND TEST PLAN	02
1724000204-IN-DS-00007	INSTRUMENT AND VALVES DATA SHEETS	01
1724000204-IN-DG-00006	PNEUMATIC DIAGRAM and WIRING	03
1724000204-QC-PRO-00016	PREPARATION FOR SHIPPING WITH HANDLING AND STORAGE PROCEDURES	00
1724000204-QC-LIS-00012	SDV - BDV AND TIGHT SHUT-OFF XV VALVES - MANUFACTURERS RECORD BOOK (FINAL DOSSIER) - INDEX	01
1724000204-IN-MAN-00014	SDV - BDV AND TIGHT SHUT-OFF XV VALVES - TECHNICAL OPERATING AND MAINTENANCE MANUAL – COMPLETE	01
1724000204-QC-DB-00011	SDV- BDV AND TIGHT SHUT-OFF XV VALVES - MANUFACTURERS RECORD BOOK (FINAL DOSSIER)	00
1724000204-COM-LIS-00015	SPARE PART AND SPECIAL TOOLS INDEX REGISTER (COMMISSIONING, 2-YEARs OPERATION)	01
1724000204-MD-LIS-00001	SUPPLIER MASTER INDEX REGISTER (SMIR)	02
1724000204-IN-DA-00004	VALVE, ACTUATOR AND ASSEMBLY GENERAL ARRANGEMENTS DRAWING AND NAMEPLATE DRAWING	04
1724000204-MAT-PRO-00009	VALVES SURFACE PREPARATION AND PAINTING PROCEDURES	02
SUPPLIER: TERRANOVA – PO: 1724000979		
1724000979-IN-LIS-00009	ATEX REGISTER-PT,PDT,TT,LT RADAR	02
1724000979-QC-PRO-00005	FACTORY ACCEPTANCE TEST PROCEDURE	04
1724000979-IN-DA-00003	GENERAL ARRANGEMENT DRAWINGS (INCLUDING TW CALCULATIONS)	03
1724000979-QC-ITP-00002	INSPECTION AND TEST PLAN -PT,PDT,TT,LT RADAR	02
1724000979-IN-MAN-00008	INSTALLATION, OPERATION AND MAINTENANCE MANUAL	03
1724000979-IN-DS-00004	INSTRUMENT DATA SHEETS-PT,PDT,TT,LT RADAR	03
1724000979-QC-LIS-00007	MANUFACTURERS RECORD BOOK (FINAL DOSSIER) - INDEX	03
1724000979-QC-DB-00006	MANUFACTURERS RECORD BOOK (FINAL DOSSIER) -PT,PDT,TT,LT RADAR	03
1724000979-QC-PRO-00012	PACKING, HANDLING, SHIPPING, PRESERVATION AND STORAGE PROCEDURES	01
1724000979-COM-LIS-00011	SPARE PART INDEX REGISTER -PT,PDT,TT,LT RADAR	01
1724000979-MD-LIS-00001	SUPPLIER MASTER INDEX REGISTER (SMIR)-PT,PDT,TT,LT RADAR	01
1724000979-IN-LIS-00010	VENDOR ASSET AND TAG REGISTER-PT,PDT,TT,LT RADAR	01

Outstanding Issues / Comments

NONE

Verification

There are no deviations from code, standards or specified requirements identified.

REV.	Date Issued	Issued by [PQM]	Verified by [PEM]	Approved by [PM]
00	11/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
01	26/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
02	15/05/2025	Raffaele Degli Esposti	Claudia Giunchi	Massimiliano Brunelli

IC003 CERTIFIED (EX RATED) ELEC EQPT				
SCE TAG	**DESCRIPTION**	**SCE GROUP**	**CODE**	**NOTE**
25-PT-035	ATEX Transmitter	IC003	IC003-25-PT-035	
25-PT-037	ATEX Transmitter	IC003	IC003-25-PT-037	
25-PT-040	ATEX Transmitter	IC003	IC003-25-PT-040	
25-PT-043	ATEX Transmitter	IC003	IC003-25-PT-043	
25-PT-046	ATEX Transmitter	IC003	IC003-25-PT-046	
25-PT-049	ATEX Transmitter	IC003	IC003-25-PT-049	
43-FT-001	ATEX Transmitter	IC003	IC003-43-FT-001	
43-LT-003	ATEX Transmitter	IC003	IC003-43-LT-003	
43-LT-001	ATEX Transmitter	IC003	IC003-43-LT-001	
43-PT-001	ATEX Transmitter	IC003	IC003-43-PT-001	
25-FT-031	ATEX Transmitter	IC003	IC003-25-FT-031	
25-FT-032	ATEX Transmitter	IC003	IC003-25-FT-032	
25-FT-033	ATEX Transmitter	IC003	IC003-25-FT-033	
25-FT-034	ATEX Transmitter	IC003	IC003-25-FT-034	
25-FT-036	ATEX Transmitter	IC003	IC003-25-FT-036	
25-FT-038	ATEX Transmitter	IC003	IC003-25-FT-038	
25-PT-001	ATEX Transmitter	IC003	IC003-25-PT-001	
25-PT-055A	ATEX Transmitter	IC003	IC003-25-PT-055A	
25-PT-055B	ATEX Transmitter	IC003	IC003-25-PT-055B	
25-FE-031	ATEX Instrument	IC003	IC003-25-FE-031	
25-FE-032	ATEX Instrument	IC003	IC003-25-FE-032	
25-FE-033	ATEX Instrument	IC003	IC003-25-FE-033	
25-FE-034	ATEX Instrument	IC003	IC003-25-FE-034	
25-FE-036	ATEX Instrument	IC003	IC003-25-FE-036	
25-FE-038	ATEX Instrument	IC003	IC003-25-FE-038	
25-RO-024	ATEX Instrument	IC003	IC003-25-RO-024	
25-RO-005	ATEX Instrument	IC003	IC003-25-RO-005	
25-RO-008	ATEX Instrument	IC003	IC003-25-RO-008	
25-RO-010	ATEX Instrument	IC003	IC003-25-RO-010	
25-RO-013	ATEX Instrument	IC003	IC003-25-RO-013	
25-RO-016	ATEX Instrument	IC003	IC003-25-RO-016	
25-RO-019	ATEX Instrument	IC003	IC003-25-RO-019	
25-RO-022	ATEX Instrument	IC003	IC003-25-RO-022	
64-FG-001	ATEX Instrument	IC003	IC003-64-FG-001	
80-RO-001	ATEX Instrument	IC003	IC003-80-RO-001	
25-FY-031	ATEX Instrument	IC003	IC003-25-FY-031	
25-FY-032	ATEX Instrument	IC003	IC003-25-FY-032	
25-FY-033	ATEX Instrument	IC003	IC003-25-FY-033	
25-FY-034	ATEX Instrument	IC003	IC003-25-FY-034	
25-FY-036	ATEX Instrument	IC003	IC003-25-FY-036	
25-FY-038	ATEX Instrument	IC003	IC003-25-FY-038	
25-PY-035	ATEX Instrument	IC003	IC003-25-PY-035	
25-PY-037	ATEX Instrument	IC003	IC003-25-PY-037	
25-PY-040	ATEX Instrument	IC003	IC003-25-PY-040	

25-PY-043	ATEX Instrument	IC003	IC003-25-PY-043	
25-PY-046	ATEX Instrument	IC003	IC003-25-PY-046	
25-PY-049	ATEX Instrument	IC003	IC003-25-PY-049	
25-PY-055A	ATEX Instrument	IC003	IC003-25-PY-055A	
25-PY-055B	ATEX Instrument	IC003	IC003-25-PY-055B	
43-LY-031	ATEX Instrument	IC003	IC003-43-LY-031	
25-XV-004	ATEX ActuatedValve	IC003	IC003-25-XV-004	
25-XV-006	ATEX ActuatedValve	IC003	IC003-25-XV-006	
25-XV-008	ATEX ActuatedValve	IC003	IC003-25-XV-008	
25-XV-009	ATEX ActuatedValve	IC003	IC003-25-XV-009	
25-XV-011	ATEX ActuatedValve	IC003	IC003-25-XV-011	
25-XV-012	ATEX ActuatedValve	IC003	IC003-25-XV-012	
25-XV-014	ATEX ActuatedValve	IC003	IC003-25-XV-014	
25-XV-015	ATEX ActuatedValve	IC003	IC003-25-XV-015	
25-XV-017	ATEX ActuatedValve	IC003	IC003-25-XV-017	
25-XV-018	ATEX ActuatedValve	IC003	IC003-25-XV-018	
25-XV-020	ATEX ActuatedValve	IC003	IC003-25-XV-020	
25-XV-021	ATEX ActuatedValve	IC003	IC003-25-XV-021	
64-SDV-001	ATEX ActuatedValve	IC003	IC003-64-SDV-001	
80-XV-001	ATEX ActuatedValve	IC003	IC003-80-XV-001	
25-XV-024	ATEX ActuatedValve	IC003	IC003-25-XV-024	

TECHNICAL INTEGRITY VERIFICATION REPORT IC005-01-Rev.02

Client: **Crosswind**

Project: **HOLLANDSE KUST NOORD WIND PARK Project - Contract No. CW-I-WP4-2023-05**

Installation: **Base Load Power Hub (BLPH)**

SCE Performance Standard

Reference document: Safety Critical Elements (SCE) and Performance Standard Doc. No. 123A90-DDL-SAF-RE-30003 Rev.04

SCE Description: Electrical earthing continuity and earth bonding **SCE ID**: IC005

SCE TAG	DESCRIPTION	SCE CODE
BLPH -AIR TERMINAL RODS	LIGHTNING PROTECTION SYSTEM - AIR TERMINAL RODS	IC005-BLPH -AIR TERMINAL RODS
BLPH - SPDs	LIGHTNING PROTECTION SYSTEM - SURGE PROTECTION DEVICES	IC005-BLPH - SPDs

SCE Boundaries: Lighting protection system **SCE Functionality Criteria**: To minimise the likelihood of ignition from lightning and static discharge in hazardous areas

PHASE: Design / Procurement / Fabrication / Construction / Commissioning

Performance Standard: IC005-01

Criteria **Description**

The criteria selected for design, procurement, fabrication, construction, and commissioning are based on projects and safety technical standards, industry best practices, and regulatory requirements. These ensure the platform's safety, reliability, and compliance at every stage, focusing on quality, integrity, and performance across the project lifecycle.

Detailed criterias are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

Technical Integrity Verification Activities

Activity **Details**

Assurance is the processes that ensures a consistent meet of the performance criteria. It involves checks, audits, and monitoring to verify that operations remain within required parameters, identifying and mitigating risks to maintain safety and efficiency.

Detailed assurance activities are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

A = Activity closed, it has been demonstrated that the performance standard has been met.

B = Activity undertaken, comments outstanding performance standard has not been met.

B* = Activity is not in compliance with Performance Standard. A documented review of the technical solution has been completed by Duty Holder/Owner, and the review has concluded that the current solution is acceptable and has an equivalent level of safety. No further action is required by Verifier.

C = Activity cannot be completed, further information required, see comments below.

Phase	Assurance	Status
Design	Basic Design Engineering Package	
	Company review and approval of the design documents by suitable qualified personnel according EEHA	
	Company review and approval of the design documents are aligned with project requirements	
Proc.	Company review and approval of the design documents are aligned with project requirements	
	Verify that the material requisition and the technical bid evaluation are attached to the purchase order Suppliers Declaration of Conformity	
	Perform audits based on the criticality rating of the supply and new suppliers.	
Fabr.	Witnessing of the Factory Acceptance test by suitable qualified inspector according EEHA	
	Review and approve Manufacturer Record Book	
Const.	Mechancial completion checks and compilation of related ITRs	

Tags

Rosetti has performed the above-listed verification activities, which apply to the platform

Documents Reviewed

Document No.	Title	Rev.
123A90-DDL-EL-SP-20006	Technical Specification, IDS and DDS for Neutral Earthing Resistor (NER)	
123A90-DDL-EL-MR-20075	MR - for Earthing and Lightning Materials	
123A90-DDL-EL-DS-20076	TDS - Earthing and Lightning Materials	

TECHNICAL INTEGRITY VERIFICATION REPORT IC005-01-Rev.02

Documents Reviewed

Document No.	Title	Rev.
123A90-DDL-EL-DD-20090	Electrical Typical Installation Details - Earthing System	01
123A90-DDL-EL-DL-20132	Base Load Power Hub (BLPH) - Earthing & Lightining Layout - Top Deck	01
123A90-DDL-EL-DL-20133	Base Load Power Hub (BLPH) - Earthing & Lightining Layout - Lower Deck	01
123A90-DDL-EL-DL-20134	Base Load Power Hub - Earthing & Lightining Layout - Below Lower deck	01
123A90-DDL-EL-DL-20136	BASE LOAD POWER HUB (BLPH) - Earthing & Lightining Layout - HV Switchroom	01
123A90-DDL-EL-DL-20137	BASE LOAD POWER HUB (BLPH) - Earthing & Lightining Layout - LV Switchroom	01
123A90-DDL-EL-DL-20138	BASE LOAD POWER HUB (BLPH) - Earthing & Lightining Layout - UPSs & Batteries Switchroom	01
123A90-DDL-IN-DL-40013	Earthing layouts drawings (Onshore CCR, Offshore ITER)	01

Outstanding Issues / Comments

NONE

Verification

There are no deviations from code, standards or specified requirements identified.

REV.	Date Issued	Issued by [PQM]	Verified by [PEM]	Approved by [PM]
00	11/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
01	26/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
02	15/05/2025	Raffaele Degli Esposti	Claudia Giunchi	Massimiliano Brunelli

TECHNICAL INTEGRITY VERIFICATION REPORT IC007-01_Rev.02

Client: **Crosswind**

Project: **HOLLANDSE KUST NOORD WIND PARK Project - Contract No. CW-I-WP4-2023-05**

Installation: **Base Load Power Hub (BLPH)**

SCE Performance Standard

Reference document: Safety Critical Elements (SCE) and Performance Standard Doc. No. 123A90-DDL-SAF-RE-30003 Rev.04

SCE Description: INERT GAS BLANKET SYSTEM **SCE ID**: IC007

SCE TAG	DESCRIPTION	SCE CODE
64-AT-051	OXYGEN ANALYZER LOCATED INSIDE NITROGEN GENERATION PAKAGE A-64000	IC007-64-AT-051
64-PT-059	64-PT-059 LOCATED ON NITROGEN RECIEVER V-64001 (INSIDE NITROGEN GENERATION PAKAGE A-64000)	IC007-64-PT-059
64-PT-002	64-PT-002 LOCATED ON NITROGEN HEADER	IC007-64-PT-002

SCE Boundaries: Nitrogen blanketing for Hydrogen vent system

SCE Functionality Criteria: To provide an inert atmosphere within enclosed process systems to prevent ignition of flammable inventory.

PHASE: Design / Procurement / Fabrication / Construction / Commissioning

Performance Standard: IC007-01

Criteria Description

The criteria selected for design, procurement, fabrication, construction, and commissioning are based on projects and safety technical standards, industry best practices, and regulatory requirements. These ensure the platform's safety, reliability, and compliance at every stage, focusing on quality, integrity, and performance across the project lifecycle.

Detailed criterias are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

Technical Integrity Verification Activities

Activity Details

Assurance is the processes that ensures a consistent meet of the performance criteria. It involves checks, audits, and monitoring to verify that operations remain within required parameters, identifying and mitigating risks to maintain safety and efficiency.

Detailed assurance activities are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

A = Activity closed, it has been demonstrated that the performance standard has been met.

B = Activity undertaken, comments outstanding performance standard has not been met.

B* = Activity is not in compliance with Performance Standard. A documented review of the technical solution has been completed by Duty Holder/Owner, and the review has concluded that the current solution is acceptable and has an equivalent level of safety. No further action is required by Verifier.

C = Activity cannot be completed, further information required, see comments below.

Phase	Assurance	Status
Design	Basic Design Engineering Package	
	Company review and approval of the design documents by suitable qualified personnel according EEHA	
	Company review and approval of the design documents are aligned with project requirements	
Proc.	Verify that the material requisition and the technical bid evaluation are attached to the purchase order Suppliers Declaration of Conformity	
	Verification that all ITP activities are included in the Material Requisition	
	Perform audits based on the criticality rating of the supply and new suppliers.	
Fabr.	Witnessing of the Factory Acceptance test by suitable qualified inspector	
	Review and approve the Manufacturer Record Book	
Const.	Mechanical completion checks and compilation of related ITRs	
Comm.	Witnessing of the Site Acceptance test by suitable qualified inspector and issuance of commissioning reports	

Tags

Rosetti has performed the above-listed verification activities, which apply to the platform

TECHNICAL INTEGRITY VERIFICATION REPORT IC007-01_Rev.02

Documents Reviewed

Document No.	Title	Rev.
1724000437-MAC-LIS-00027	ATEX DOCUMENTATION - NITROGEN GENERATION PACKAGE	01
1724000437-MAC-LIS-00026	ATEX REGISTER - NITROGEN GENERATION PACKAGE	03
1724000437-EL-LIS-00017	CABLES LIST - NITROGEN GENERATION PACKAGE U-64000	01
1724000437-EL-LIS-00014	ELECTRICAL LOAD LIST - NITROGEN GENERATION PACKAGE	02
1724000437-MAC-DD-00006	EQUIPMENT SECTIONAL DRAWING WITH BILL OF MATERIAL -NITROGEN GENERATION PACKAGE	04
1724000437-QC-PRO-00023	FAT (FACTORY ACCEPTANCE TEST) PROCEDURE - NITROGEN GENERATION PACKAGE	03
1724000437-QC-PRO-00030	HANDLING, PRESERVATION AND PACKAGING PROCEDURE - NITROGEN GENERATION PACKAGE U-64000	01
1724000437-QC-PRO-00022	HYDROSTATIC TEST PROCEDURE - NITROGEN GENERATION PACKAGE	05
1724000437-QC-ITP-00002	INSPECTION TEST PLAN (ITP) - NITROGEN GENERATION PACKAGE	02
1724000437-MAC-MAN-00029	INSTALLATION, OPERATING AND MAINTENANCE MANUAL (INCLUDING SITE ERECTION INSTRUCTIONS AND PROCEDURES) - NITROGEN GENERATION PACKAGE U-64000	02
1724000437-MAC-DS-00013	INSTRUMENT DATA SHEETS - NITROGEN GENERATION PACKAGE	04
1724000437-IN-LIS-00016	INSTRUMENT LIST WITH SET POINTS-CONTROL-ALARM-SHUTDOWN - NITROGEN GENERATION PACKAGE	05
1724000437-IN-LIS-00015	IO LIST - NITROGEN GENERATION PACKAGE U-64000	04
1724000437-QC-LIS-00025	MANUFACTURERS RECORD BOOK (FINAL DOSSIER) - INDEX - NITROGEN GENERATION PACKAGE	01
1724000437-QC-DB-00024	MANUFACTURERS RECORD BOOK (FINAL DOSSIER) - NITROGEN GENERATION PACKAGE	00
1724000437-NDT-PRO-00019	NDT PROCEDURES INCLUDING PERSONNEL QUALIFICATIONS - NITROGEN GENERATION PACKAGE	02
1724000437-MAC-DS-00011	NITROGEN GENERATION PACKAGE - EQUIPMENT DATA SHEETS INCLUDING PSA, ETC.	03
1724000437-ST-RE-00010	NITROGEN GENERATION PACKAGE U-64000 - PACKAGE STRUCTURAL CALCULATION REPORT INCLUDING FIXING POINTS and LIFTING POINTS	02
1724000437-MAC-CA-00031	NITROGEN RECEIVER CALCULATION	03
1724000437-MAC-DD-00007	PACKAGE 3D MODEL DRAWING AND ELECTRONIC FILE - NITROGEN GENERATION PACKAGE	01
1724000437-MAC-CE-00004	PACKAGE CAUSE EFFECT MATRIX -LOGIC DIAGRAMS -NITROGEN GENERATION PACKAGE	01
1724000437-MAC-DS-00012	PACKAGE EQUIPMENT NOISE DATA SHEETS INCLUDING PSA, ETC. - NITROGEN GENERATION PACKAGE	02
1724000437-MAC-DA-00005	PACKAGE GENERAL ARRANGEMENT AND DIMENSIONAL OUTLINE DRAWINGS- NITROGEN GENERATION PACKAGE	03
1724000437-PR-PID-00018	PACKAGE PID - NITROGEN GENERATION PACKAGE	06
1724000437-MAC-DD-00008	PACKAGE PIPING SCHEMATICS AND BILL OF MATERIALS - NITROGEN GENERATION PACKAGE	01
1724000437-MAC-DG-00009	PACKAGE WIRING DIAGRAM INCLUDING LAYOUT OF PACKAGE CONTROL PANEL - NITROGEN GENERATION PACKAGE	05
1724000437-MAT-PRO-00021	PAINTING PROCEDURE - NITROGEN GENERATION PACKAGE	03
1724000437-MD-LIS-00001	SMIR - SUPPLIER MASTER INFORMATION REGISTER	00
1724000437-COM-LIS-00028	SPARE PARTS LIST (2 YEARS AND COMMISSIONING AND START-UP) - NITROGEN GENERATION PACKAGE	01
1724000437-MAC-SP-00003	SYSTEM-PACKAGE FUNCTIONAL DESCRIPTION - NITROGEN GENERATION PACKAGE	05
1724000437-WEL-LIS-00020	WELDING BOOK (WPS, PQR, WELDERS QUALIFICATIONS, WELDING MAPS, ETC.) - NITROGEN GENERATION PACKAGE	03

Outstanding Issues / Comments

NONE

Verification

There are no deviations from code, standards or specified requirements identified.

REV.	Date Issued	Issued by [PQM]	Verified by [PEM]	Approved by [PM]
00	11/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
01	26/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
02	15/05/2025	Raffaele Degli Esposti	Claudia Giunchi	Massimiliano Brunelli

TECHNICAL INTEGRITY VERIFICATION REPORT LS001-01 Rev.02

Client: **Crosswind**

Project: **HOLLANDSE KUST NOORD WIND PARK Project - Contract No. CW-I-WP4-2023-05**

Installation: **Base Load Power Hub (BLPH)**

SCE Performance Standard

Reference document: Safety Critical Elements (SCE) and Performance Standard Doc. No. 123A90-DDL-SAF-RE-30003

SCE Description: Personal Survival Equipment (PSE) **SCE ID**: LS001

SCE TAG	DESCRIPTION	SCE CODE
BLPH - SAFETY CABINET	SAFETY CABINET (WITH IMMERSION SUIT, LIFE JACKET)	LS001 -BLPH - SAFETY CABINET
BLPH - FIRST AID KIT	FIRST AID KIT	LS001 -BLPH - FIRST AID KIT
BLPH - RESUSCITATION UNIT	RESUSCITATION UNIT	LS001 -BLPH - RESUSCITATION UNIT
BLPH - ESCAPE MASK	ESCAPE MASK	LS001 -BLPH - ESCAPE MASK
BLPH - EVACUATION STRETCHER	EVACUATION STRETCHER	LS001 -BLPH - EVACUATION STRETCHER
BLPH - LIFEBUOY	LIFEBUOY	LS001 -BLPH - LIFEBUOY

SCE Boundaries: Personal Survival equipment
- Safety Cabinet (With Immersion Suit, Life Jacket)
- First Aid Kit
- Resuscitation Unit
- Escape Masks
- Evacuation Stretcher
- Liferaft
- Lifebuoy

SCE Functionality Criteria: To provide all personnel escaping from a Major Accident Event with suitable protective clothing and equipment.

To provide personnel with suitable protective equipment for emergency response roles.

PHASE: Design / Procurement / Fabrication / Construction / Commissioning

Performance Standard: LS001-01

Criteria Description

The criteria selected for design, procurement, fabrication, construction, and commissioning are based on projects and safety technical standards, industry best practices, and regulatory requirements. These ensure the platform's safety, reliability, and compliance at every stage, focusing on quality, integrity, and performance across the project lifecycle.

Detailed criteria are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.0

Technical Integrity Verification Activities

Activity Details

Assurance is the processes that ensures a consistent meet of the performance criteria. It involves checks, audits, and monitoring to verify that operations remain within required parameters, identifying and mitigating risks to maintain safety and efficiency.

Detailed assurance activities are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.

A = Activity closed, it has been demonstrated that the performance standard has been met.

B = Activity undertaken, comments outstanding performance standard has not been met.

B* = Activity is not in compliance with Performance Standard. A documented review of the technical solution has been completed by Duty Holder/Owner, and the review has concluded that the current solution is acceptable and has an equivalent level of safety. No further action is required by Verifier.

C = Activity cannot be completed, further information required, see comments below.

Phase	Assurance	Status
Design	Compliance with SOLAS (Safety of Life at Sea), Lifesaving Appliances Code requirements.	
	Company review and approval of the design documents are aligned with project requirements	
Proc.	Verify and review the documentation provided	
Fabr.	Verify and review the documentation provided	
Const.	Mechancial completion checks and compilation of related ITRs	
Comm.	N/A	

TECHNICAL INTEGRITY VERIFICATION REPORT LS001-01 Rev.02

Tags

Rosetti has performed the above-listed verification activities, which apply to the platform

Documents Reviewed

Document No.	Title	Rev.
K559-2254-PM-PLN-003	Basic Design Engineering Package	
123A90-DDL-SAF-DL-30025	Escape Routes, Fire Fighting, Life Saving Equipment and Safety Equipment Layouts Drawings	01
123A90-DDL-SAF-DL-30026	Escape Routes, Fire Fighting, Life Saving Equipment and Safety Equipment Layouts Drawings - upper deck	03

Outstanding Issues / Comments

NONE

Verification

There are no deviations from code, standards or specified requirements identified.

REV.	Date Issued	Issued by [PQM]	Verified by [PEM]	Approved by [PM]
00	11/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
01	26/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
02	15/05/2025	Raffaele Degli Esposti	Claudia Giunchi	Massimiliano Brunelli

TECHNICAL INTEGRITY VERIFICATION REPORT LS002-01-Rev.02

Client: **Crosswind**

Project: **HOLLANDSE KUST NOORD WIND PARK Project - Contract No. CW-I-WP4-2023-05**

Installation: **Base Load Power Hub (BLPH)**

SCE Performance Standard

Reference document: Safety Critical Elements (SCE) and Performance Standard Doc. No. 123A90-DDL-SAF-RE-30003 Rev.04

SCE Description: Alternate Means of Escape **SCE ID**: LS002

SCE TAG	**DESCRIPTION**	**SCE CODE**
BLPH - LIFERAFT	LIFERAFT	LS002 -BLPH - LIFERAFT

SCE Boundaries: Alternate Means of Escape
Liferaft

SCE Functionality Criteria: To provide for the safe escape of all persons from the installation in case arrangements for evacuation fail.

PHASE: Design / Procurement / Fabrication / Construction / Commissioning

Performance Standard: LS002-01

Criteria Description

The criteria selected for design, procurement, fabrication, construction, and commissioning are based on projects and safety technical standards, industry best practices, and regulatory requirements. These ensure the platform's safety, reliability, and compliance at every stage, focusing on quality, integrity, and performance across the project lifecycle.

Detailed criterias are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

Technical Integrity Verification Activities

Activity Details

Assurance is the processes that ensures a consistent meet of the performance criteria. It involves checks, audits, and monitoring to verify that operations remain within required parameters, identifying and mitigating risks to maintain safety and efficiency.

Detailed assurance activities are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

A = Activity closed, it has been demonstrated that the performance standard has been met.

B = Activity undertaken, comments outstanding performance standard has not been met.

B* = Activity is not in compliance with Performance Standard. A documented review of the technical solution has been completed by Duty Holder/Owner, and the review has concluded that the current solution is acceptable and has an equivalent level of safety. No further action is required by Verifier.

C = Activity cannot be completed, further information required, see comments below.

Phase	Assurance	Status
Design	Class Approval Letter for sufficient number of life raft places and suitable distribution of type and sizes of life rafts	
	Company review and approval of the design documents are aligned with project requirements	
Proc.	Verify and review the documentation provided	
Fabr.	Verify and review the documentation provided	
Const.	Mechanical completion checks and compilation of related ITRs	
Comm.	N/A	

Tags

Rosetti has performed the above-listed verification activities, which apply to the platform

Documents Reviewed

Document No.	Title	Rev.
K559-2254-PM-PLN-003	Basic Design Engineering Package	
123A90-DDL-SAF-DL-30025	Escape Routes, Fire Fighting, Life Saving Equipment and Safety Equipment Layouts Drawings	01
123A90-DDL-SAF-DL-30026	Escape Routes, Fire Fighting, Life Saving Equipment and Safety Equipment Layouts Drawings - upper deck	03

TECHNICAL INTEGRITY VERIFICATION REPORT LS002-01-Rev.02

Outstanding Issues / Comments

NONE

Verification

There are no deviations from code, standards or specified requirements identified.

REV.	Date Issued	Issued by [PQM]	Verified by [PEM]	Approved by [PM]
00	11/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
01	26/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
02	15/05/2025	Raffaele Degli Esposti	Claudia Giunchi	Massimiliano Brunelli

TECHNICAL INTEGRITY VERIFICATION REPORT PC001-01-Rev.02

Client: **Crosswind**

Project: **HOLLANDSE KUST NOORD WIND PARK Project - Contract No. CW-I-WP4-2023-05**

Installation: **Base Load Power Hub (BLPH)**

SCE Performance Standard

Reference document:	Safety Critical Elements (SCE) and Performance Standard	Doc. No.	123A90-DDL-SAF-RE-30003	Rev.04
	Performance Standards Collection	Doc. No.	123A90-DDL-MD-LIS-01010	Rev-00

SCE Description: Pressure Vessels **SCE ID: PC001** **SCE CODE:** PC001-V-25001A, PC001-V-25001B, PC001-V-25001C, PC001-V-25001D, PC001-V-25001E, PC001-V-25001F, PC001-V-43001, PC001-Q-43004

SCE Boundaries: Pressure Vessels **SCE Functionality Criteria:** Ensure containment of gas during normal operation through the design life of the facility

PHASE: Design / Procurement / Fabrication / Construction / Commissioning

Performance Standard: PC001-01

Criteria

The criteria selected for design, procurement, fabrication, construction, and commissioning are based on projects and safety technical standards, industry best practices, and regulatory requirements. These ensure the platform's safety, reliability, and compliance at every stage, focusing on quality, integrity, and performance across the project lifecycle.

Detailed criterias are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

Assurance

Assurance activities **Details**

Assurance is the processes that ensures a consistent meet of the performance criteria. It involves checks, audits, and monitoring to verify that operations remain within required parameters, identifying and mitigating risks to maintain safety and efficiency.

Detailed assurance activities are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 rev.00

A = Activity closed, it has been demonstrated that the performance standard has been met.

B = Activity undertaken, comments outstanding performance standard has not been met.

B* = Activity is not in compliance with Performance Standard. A documented review of the technical solution has been completed by Duty Holder/Owner, and the review has concluded that the current solution is acceptable and has an equivalent level of safety. No further action is required by Verifier.

C = Activity cannot be completed, further information required, see comments below.

Phase	Assurance	Status
Design	Basic Design Engineering Package	
	DEM1 compliance	
	Notified Body and ASME AI to verify and approve the design.	
	Company review and approval of the design documents are aligned with project requirements	
	Compliance of the vendor to the material requisition by preparing a technical bid evaluation.	
Proc.	Verify that the material requisition and the technical bid evaluation are attached to the purchase order Suppliers Declaration of Conformity	
	Perform audits based on the criticality rating of the supply and new suppliers.	
Fabr.	Perform intervention points as per approved ITP.	
	Verify the material certificates.	
	Witnessing of the Factory Acceptance test	
Const.	Review and approve Manufacturer Record Book & Design Examination Certificates	

TECHNICAL INTEGRITY VERIFICATION REPORT PC001-01-Rev.02

Const.	Verification of the Inspection test report	
Comm.	Compliance to OTPs.	
	Issuance of commissioning reports	

Tags

Rosetti has performed the above-listed verification activities, which apply to pressure-containing vessels. The suppliers of the Tags are Brembana & Rolle under purchase order no. 1723001756, C.A.M.P.I. under the purchase order no. 1724000163, and Encore under the purchase order no. 1724000887.

The tags covered by this verification activities are listed below:

PC001 VESSELS

V-25001A	HYDROGEN HORIZONTAL STORAGE VESSEL V-25001A	PC001	PC001-V-25001A
V-25001B	HYDROGEN HORIZONTAL STORAGE VESSEL V-25001B	PC001	PC001-V-25001B
V-25001C	HYDROGEN HORIZONTAL STORAGE VESSEL V-25001C	PC001	PC001-V-25001C
V-25001D	HYDROGEN HORIZONTAL STORAGE VESSEL V-25001D	PC001	PC001-V-25001D
V-25001E	HYDROGEN HORIZONTAL STORAGE VESSEL V-25001E	PC001	PC001-V-25001E
V-25001F	HYDROGEN HORIZONTAL STORAGE VESSEL V-25001F	PC001	PC001-V-25001F
V-43001	HYDROGEN VENT KO DRUM	PC001	PC001-V-43001
Q-43004	HYDROGEN VENT	PC001	PC001-Q-43004

Documents Reviewed

Document No.	Title	Rev.
1723001756-MAC-DD-00024	Detailed Drawing - Bill of Material- H2 STORAGE VESSEL - ITEM V-25001A-F	03
1723001756-MAC-DD-00023	Detailed Drawing - Manhole Davit - H2 STORAGE VESSEL ITEM V-25001A-F	00
1723001756-MAC-DD-00005	DETAILED DRAWING INCLUDING CROSS SECTION-EXPLODED VIEW DRAWING - H2 STORAGE VESSEL ITEM V-25001A-F	02
1723001756-QC-LIS-00016	EQUIPMENT MANUFACTURERS RECORD BOOK (FINAL DOSSIER) - INDEX ITEM V25001 A F - H2 STORAGE VESSEL	02
1723001756-QC-DB-00017	EQUIPMENT MANUFACTURERS RECORD BOOK – COMPLETE - H2 STORAGE VESSEL ITEM V-25001A	03
1723001756-QC-DB-00017-B	EQUIPMENT MANUFACTURERS RECORD BOOK – COMPLETE - H2 STORAGE VESSEL ITEM V-25001B	02
1723001756-QC-DB-00017-C	EQUIPMENT MANUFACTURERS RECORD BOOK – COMPLETE - H2 STORAGE VESSEL ITEM V-25001C	02
1723001756-QC-DB-00017-D	EQUIPMENT MANUFACTURERS RECORD BOOK – COMPLETE - H2 STORAGE VESSEL ITEM V-25001D	02
1723001756-QC-DB-00017-E	EQUIPMENT MANUFACTURERS RECORD BOOK – COMPLETE - H2 STORAGE VESSEL ITEM V-25001E	02
1723001756-QC-DB-00017-F	EQUIPMENT MANUFACTURERS RECORD BOOK – COMPLETE - H2 STORAGE VESSEL ITEM V-25001F	02
1723001756-MAC-DA-00004	GENERAL ARRANGEMENTS DRAWINGS AND FOUNDATION LOADING DIAGRAM - HYDROGEN STORAGE VESSEL ITEM V-25001A-F	04
1723001756-QC-PRO-00011	HEAT TREATMENT PROCEDURES (inc. PWHT) - H2 STORAGE VESSEL	02
1723001756-QC-PRO-00012	HYDROSTATIC TEST PROCEDURES (FAT PROCEDURE) - H2 STORAGE VESSEL	02
1723001756-QC-ITP-00002	INSPECTION AND TEST PLAN - H2 STORAGE VESSEL	04
1723001756-MAC-MAN-00019	INSTALLATION AND OPERATING MAINTENANCE MANUAL (PED) - H2 STORAGE VESSEL - H2 STORAGE VESSEL	01
1723001756-MAC-DD-00006	NAMEPLATE DRAWING - H2 STORAGE VESSEL ITEM V-25001A-F	03
1723001756-NDT-LIS-00010	NDE OPERATORS LIST AND QUALIFICATIONS - H2 STORAGE VESSEL	03
1723001756-NDT-PRO-00009	NON-DESTRUCTIVE EXAMINATIONS PROCEDURES (NDE) - H2 STORAGE VESSEL	03
1723001756-MAT-PRO-00008	PAINTING PROCEDURE (including surface preparation)- H2 STORAGE VESSEL	02
1723001756-MAC-CAL-00003	PRESSURE VESSEL MECHANICAL CALCULATION - H2 STORAGE VESSEL	03
1723001756-TI-DD-00021	SHIPPING DRAWINGS - H2 STORAGE VESSEL	04
1723001756-QC-PRO-00020	SHIPPING, PACKING, HANDLING AND STORAGE and PRESERVATIONS, PROCEDURES - H2 STORAGE VESSEL	03
1723001756-COM-LIS-00018	SPARE PART INDEX REGISTER (COMMISSIONING, OPERATION) - H2 STORAGE VESSEL	01
1723001756-MD-LIS-00001	SUPPLIER MASTER INDEX REGISTER (SMIR) - H2 STORAGE VESSEL	00
1723001756-MAC-DS-00007	TECHNICAL DATA SHEETS - H2 STORAGE VESSEL-V-25001 A-F	03
1723001756-WEL-DD-00014	WELDING DETAIL DRAWINGS - HYDROGEN STORAGE VESSEL ITEM V-25001A-F	03
1723001756-WEL-LIS-00015	WELDING OPERATORS LIST and WELDER QUALIFICATIONS RECORDS (WPQ) - H2 STORAGE VESSEL	02

TECHNICAL INTEGRITY VERIFICATION REPORT PC001-01-Rev.02

Documents Reviewed

Document No.	Title	Rev.
1723001756-WEL-PRO-00013	WELDING PROCEDURE SPECIFICATION (WPS) AND QUALIFICATIONS (PQR) RECORDS - H2 STORAGE VESSEL	04
1724000163-QC-LIS-00012	EQUIPMENT MANUFACTURERS RECORD BOOK (FINAL DOSSIER) - INDEX	02
1724000163-QC-DB-00013	EQUIPMENT MANUFACTURERS RECORD BOOK – COMPLETE	03
1724000163-MAC-DA-00004	GENERAL ARRANGEMENT DRAWINGS AND FOUNDATION LOADING	04
1724000163-QC-PRO-00010	HYDROSTATIC TEST PROCEDURES and PNEUMATIC TEST PROCEDURE (FAT PROCEDURE)	01
1724000163-QC-ITP-00002	INSPECTION AND TEST PLAN	02
1724000163-MAC-MAN-00015	INSTALLATION AND OPERATING MAINTENANCE MANUAL (IOM)	02
1724000163-MAC-CA-00003	MECHANICAL CALCULATION	03
1724000163-NDT-LIS-00009	NDE OPERATORS LIST AND QUALIFICATIONS	02
1724000163-NDT-PRO-00008	NON-DESTRUCTIVE EXAMINATIONS PROCEDURES (NDE) INCLUDING PMI	02
1724000163-MAT-PRO-00007	PAINTING PROCEDURE (including surface preparation)	03
1724000163-QC-PRO-00016	SHIPPING, PACKING, HANDLING AND STORAGE and PRESERVATIONS and PROCEDURES	02
1724000163-COM-LIS-00014	SPARE PART INDEX REGISTER (COMMISSIONING, OPERATION)	02
1724000163-MD-LIS-00001	SUPPLIER MASTER INDEX REGISTER (SMIR)	02
1724000163-MAC-DS-00006	TECHNICAL DATA SHEET - Hydrogen Vent KO Drum - V-43001	04
1724000163-WEL-LIS-00011	WELDING PROCEDURE SPECIFICATION (WPS) AND QUALIFICATIONS (PQR) RECORDS, WELDING OPERATORS LIST and WELDER QUALIFICATIONS RECORDS (WPQ) and WELDING MAP	03
23096-SNA/B/C/D/E/F/CON	Brembana & Rolle Declaration of Conformity	--
n°24003-01	Campi Declaration of Conformity	--
416041-40751-B.03-0001	DEM 1 Requirements	--
K559-2254-PM-PLN-003	Basic Design Engineering Package	02

Outstanding Issues / Comments

NONE

Verification

There are no deviations from code, standards or specified requirements identified.

REV.	Date Issued	Issued by [PQM]	Verified by [PEM]	Approved by [PM]
00	11/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
01	26/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
02	15/05/2025	Raffaele Degli Esposti	Claudia Giunchi	Massimiliano Brunelli

TECHNICAL INTEGRITY VERIFICATION REPORT PC005-01-Rev.02

Client: **Crosswind**

Project: **HOLLANDSE KUST NOORD WIND PARK Project - Contract No. CW-I-WP4-2023-05**

Installation: **Base Load Power Hub (BLPH)**

SCE Performance Standard

Reference document:	Safety Critical Elements (SCE) and Performance Standard	Doc. No.	123A90-DDL-SAF-RE-30003	Rev.04

SCE Description:	Piping System	**SCE ID**: PC005	
SCE TAG	**DESCRIPTION**	**SCE CODE**	
Refer to attached list.	Refer to attached list.	Refer to attached list.	
SCE Boundaries:	Piping System	**SCE Functionality Criteria**:	Ensure containment of gas during normal operation of the facility

PHASE: Design / Procurement / Fabrication / Construction / Commissioning

Performance Standard: PC005-01

Criteria **Description**

The criteria selected for design, procurement, fabrication, construction, and commissioning are based on projects and safety technical standards, industry best practices, and regulatory requirements. These ensure the platform's safety, reliability, and compliance at every stage, focusing on quality, integrity, and performance across the project lifecycle.

Detailed criterias are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

Technical Integrity Verification Activities

Activity **Details**

Assurance is the processes that ensures a consistent meet of the performance criteria. It involves checks, audits, and monitoring to verify that operations remain within required parameters, identifying and mitigating risks to maintain safety and efficiency.

Detailed assurance activities are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

A = Activity closed, it has been demonstrated that the performance standard has been met.

B = Activity undertaken, comments outstanding performance standard has not been met.

B* = Activity is not in compliance with Performance Standard. A documented review of the technical solution has been completed by Duty Holder/Owner, and the review has concluded that the current solution is acceptable and has an equivalent level of safety. No further action is required by Verifier.

C = Activity cannot be completed, further information required, see comments below.

Phase	Assurance	Status
Design	Basic Design Engineering Package	
	Flange Management Strategy 123A90-PML-CON-RE-04006	
	Notified Body to verify and approve the design (Only for Cat.III piping)	
	Company review and approval of the design documents are aligned with project requirements	
	Compliance to the material requisition by preparing a technical bid evaluation.	
	Perform cross check verification against P&Ids and Line List	
Proc.	Verify that the material requisition and the technical bid evaluation are attached to the purchase order	
	Perform audits based on the criticality rating of the supply and new suppliers.	
Fabr.	Perform intervention points as per approved ITP and test packs. Attendance of pressure testing by No.Bo for Cat. II (10%) III (100%) lines	
	Verify the material certificates.	
	Verification of approved DR and fabrication.	
	Review and approve Manufacturer Record Book (shop fabrication related) Design Examination Certificates (Cat.III only)	
Const.	Ready For Commissioning Certificate issued	
	Verification of test packs and attendance of pressure testing by No.Bo for Cat. II (10%) III (100%) lines.	
	Verification of flange management and associated records	
	Issuance of RFCC (ready for commissioning certificate)	
	Review and approve Manufacturer Record Book (constuction related)	

Tags

TECHNICAL INTEGRITY VERIFICATION REPORT PC005-01-Rev.02

Rosetti has performed the above-listed verification activities, which apply to the piping portion of the platform.

Documents Reviewed

Document No.	Title	Rev.
123A90-PML-QHSE-ITP-00076	Inspection And Test Plan for Piping	01
123A90-PML-QHSE-PRO-00092	PIPING FLUSHING, TESTING, DRYING AND REINSTATEMENT PROCEDURE	01
123A90-PML-WEL-LIS-05000	Welder List - Piping	01
123A90-PML-WEL-PRO-05003	Welding Book - Piping	02
123A90-PML-WEL-PRO-05005	Weld procedure qualification records (WPQRs & PQRs) - Piping	01
123A90-DDL-PP-SP-70000	Piping Material Classes	02
123A90-DDL-PP-SP-70029	Technical Specification for Piping materials narrative	02
123A90-DDL-PP-DA-70049	Piping General Arrangement - Below Lower Deck (El.+16500 to El.+22310)	01
123A90-DDL-PP-DA-70050	Piping General Arrangement - Above Lower Deck (El.+22310 to El.+28170)	01
123A90-DDL-PP-DA-70051	Piping General Arrangement - Below Upper Deck (El.+28170 to El.+30310)	01
123A90-DDL-PP-DA-70052	Piping General Arrangement - Above Upper Deck (El.+30310 to El.+33990)	01
123A90-DDL-PP-DA-70053	Piping general arrangement above upper deck (EL. +33990 to EL. 46.900)	01
123A90-DDL-PP-DD-70055	Base Load Power Hub (BLPH) - Piping floor penetration Lower and Upper deck EL. +23.310m & el. +30.310m	01
123A90-DDL-PP-DD-70056	Base Load Power Hub (BLPH) - Piping floor penetration - EL. +31.410m to el. +36.210. - Typical and detail	01
123A90-DDL-PP-DD-70059	Typical Piping Assembly	01

Outstanding Issues / Comments

NONE

Verification

There are no deviations from code, standards or specified requirements identified.

REV.	Date Issued	Issued by [PQM]	Verified by [PEM]	Approved by [PM]
00	11/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
01	26/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
02	15/05/2025	Raffaele Degli Esposti	Claudia Giunchi	Massimiliano Brunelli

PC005 PIPING SYSTEM

SCE TAG	DESCRIPTION	SCE GROUP	CODE	NOTE
1"-HY-007-03HSS-N	FROM ELECTROLYZER PACKAGE (A-20000) TO HYDROGEN STORAGE VESSELS HEADER (INLET)	PC005	PC005-1"-HY-007-03HSS-N	
2"-VL-003-01HSS-N	A20000 VENT LINE	PC005	PC005-2"-VL-003-01HSS-N	
1"-HY-007-03HSS-N	H2 COMMON INLET LINE TO STORAGE VESSELS	PC005	PC005-1"-HY-007-03HSS-N	
1"-HY-143-03HSS-N	FROM 1"-HY-007-03HSS-N TO 25-BDV-003 (VENT LINE)	PC005	PC005-1"-HY-143-03HSS-N	
1"-VL-014-01HSS-N	H2 DISTRIBUTION LINE TO STORAGE VESSELS VENT LINE	PC005	PC005-1"-VL-014-01HSS-N	
1"-HY-015-03HSS-N	H2 INLET LINE TO HYDROGEN STORAGE VESSEL V-25001A	PC005	PC005-1"-HY-015-03HSS-N	
1"-HY-016-03HSS-N	H2 INLET LINE TO HYDROGEN STORAGE VESSEL V-25001B	PC005	PC005-1"-HY-016-03HSS-N	
1"-HY-017-03HSS-N	H2 INLET LINE TO HYDROGEN STORAGE VESSEL V-25001C	PC005	PC005-1"-HY-017-03HSS-N	
1"-HY-018-03HSS-N	H2 INLET LINE TO HYDROGEN STORAGE VESSEL V-25001D	PC005	PC005-1"-HY-018-03HSS-N	
1"-HY-019-03HSS-N	H2 INLET LINE TO HYDROGEN STORAGE VESSEL V-25001E	PC005	PC005-1"-HY-019-03HSS-N	
1"-HY-020-03HSS-N	H2 INLET LINE TO HYDROGEN STORAGE VESSEL V-25001F	PC005	PC005-1"-HY-020-03HSS-N	
1"-HY-024-03HSS-N	FROM HYDROGEN STORAGE VESSEL V-25001A TO 25-PSV-001A (VENT LINE)	PC005	PC005-1"-HY-024-03HSS-N	
3"-HY-142-03HSS-N	FROM HYDROGEN STORAGE VESSEL V-25001A TO 25-BDV-005/25-PV-005 (VENT LINE)	PC005	PC005-3"-HY-142-03HSS-N	
4"-VL-145-01HSS-N	HYDROGEN STORAGE VESSEL V-25001A VENT LINE	PC005	PC005-4"-VL-145-01HSS-N	
4"-VL-025-01HSS-N	HYDROGEN STORAGE VESSEL V-25001A VENT LINE	PC005	PC005-4"-VL-025-01HSS-N	
1"-HY-026-03HSS-N	FROM HYDROGEN STORAGE VESSEL V-25001A TO HYDROGEN STORAGE VESSELS HEADER (OUTLET)	PC005	PC005-1"-HY-026-03HSS-N	
1"-HY-153-03HSS-N	N2 CONNECTING LINE TO HYDROGEN STORAGE VESSEL V-25001A	PC005	PC005-1"-HY-153-03HSS-N	
1"-HY-166-03HSS-N	FROM HYDROGEN STORAGE VESSEL V-25001B TO 25-PSV-001B (VENT LINE)	PC005	PC005-1"-HY-166-03HSS-N	
3"-HY-167-03HSS-N	FROM HYDROGEN STORAGE VESSEL V-25001B TO 25-BDV-007/25-PV-007 (VENT LINE)	PC005	PC005-3"-HY-167-03HSS-N	
4"-VL-168-01HSS-N	HYDROGEN STORAGE VESSEL V-25001B VENT LINE	PC005	PC005-4"-VL-168-01HSS-N	
4"-VL-111-01HSS-N	HYDROGEN STORAGE VESSEL V-25001B VENT LINE	PC005	PC005-4"-VL-111-01HSS-N	
1"-HY-132-03HSS-N	FROM HYDROGEN STORAGE VESSEL V-25001B TO HYDROGEN STORAGE VESSELS HEADER (OUTLET)	PC005	PC005-1"-HY-132-03HSS-N	
1"-HY-186-03HSS-N	N2 CONNECTING LINE TO HYDROGEN STORAGE VESSEL V-25001B	PC005	PC005-1"-HY-186-03HSS-N	
1"-HY-170-03HSS-N	FROM HYDROGEN STORAGE VESSEL V-25001C TO 25-PSV-001C (VENT LINE)	PC005	PC005-1"-HY-170-03HSS-N	
3"-HY-171-03HSS-N	FROM HYDROGEN STORAGE VESSEL V-25001C TO 25-BDV-010/25-PV-010 (VENT LINE)	PC005	PC005-3"-HY-171-03HSS-N	
4"-VL-172-01HSS-N	HYDROGEN STORAGE VESSEL V-25001C VENT LINE	PC005	PC005-4"-VL-172-01HSS-N	
4"-VL-112-01HSS-N	HYDROGEN STORAGE VESSEL V-25001C VENT LINE	PC005	PC005-4"-VL-112-01HSS-N	
1"-HY-133-03HSS-N	FROM HYDROGEN STORAGE VESSEL V-25001C TO HYDROGEN STORAGE VESSELS HEADER (OUTLET)	PC005	PC005-1"-HY-133-03HSS-N	

SCE TAG	DESCRIPTION	SCE GROUP	CODE	NOTE
1"-HY-187-03HSS-N	N2 CONNECTING LINE TO HYDROGEN STORAGE VESSEL V-25001C	PC005	PC005-1"-HY-187-03HSS-N	
1"-HY-174-03HSS-N	FROM HYDROGEN STORAGE VESSEL V-25001D TO 25-PSV-001D (VENT LINE)	PC005	PC005-1"-HY-174-03HSS-N	
3"-HY-175-03HSS-N	FROM HYDROGEN STORAGE VESSEL V-25001D TO 25-BDV-013/25-PV-013 (VENT LINE)	PC005	PC005-3"-HY-175-03HSS-N	
4"-VL-176-01HSS-N	HYDROGEN STORAGE VESSEL V-25001D VENT LINE	PC005	PC005-4"-VL-176-01HSS-N	
4"-VL-113-01HSS-N	HYDROGEN STORAGE VESSEL V-25001D VENT LINE	PC005	PC005-4"-VL-113-01HSS-N	
1"-HY-134-03HSS-N	FROM HYDROGEN STORAGE VESSEL V-25001D TO HYDROGEN STORAGE VESSELS HEADER (OUTLET)	PC005	PC005-1"-HY-134-03HSS-N	
1"-HY-188-03HSS-N	N2 CONNECTING LINE TO HYDROGEN STORAGE VESSEL V-25001D	PC005	PC005-1"-HY-188-03HSS-N	
1"-HY-179-03HSS-N	FROM HYDROGEN STORAGE VESSEL V-25001E TO 25-PSV-001E (VENT LINE)	PC005	PC005-1"-HY-179-03HSS-N	
3"-HY-180-03HSS-N	FROM HYDROGEN STORAGE VESSEL V-25001E TO 25-BDV-016/25-PV-016 (VENT LINE)	PC005	PC005-3"-HY-180-03HSS-N	
4"-VL-181-01HSS-N	HYDROGEN STORAGE VESSEL V-25001E VENT LINE	PC005	PC005-4"-VL-181-01HSS-N	
4"-VL-114-01HSS-N	HYDROGEN STORAGE VESSEL V-25001E VENT LINE	PC005	PC005-4"-VL-114-01HSS-N	
1"-HY-135-03HSS-N	FROM HYDROGEN STORAGE VESSEL V-25001E TO HYDROGEN STORAGE VESSELS HEADER (OUTLET)	PC005	PC005-1"-HY-135-03HSS-N	
1"-HY-189-03HSS-N	N2 CONNECTING LINE TO HYDROGEN STORAGE VESSEL V-25001E	PC005	PC005-1"-HY-189-03HSS-N	
1"-HY-183-03HSS-N	FROM HYDROGEN STORAGE VESSEL V-25001F TO 25-PSV-001F (VENT LINE)	PC005	PC005-1"-HY-183-03HSS-N	
3"-HY-184-03HSS-N	FROM HYDROGEN STORAGE VESSEL V-25001F TO 25-BDV-019/25-PV-019 (VENT LINE)	PC005	PC005-3"-HY-184-03HSS-N	
4"-VL-185-01HSS-N	HYDROGEN STORAGE VESSEL V-25001F VENT LINE	PC005	PC005-4"-VL-185-01HSS-N	
4"-VL-115-01HSS-N	HYDROGEN STORAGE VESSEL V-25001F VENT LINE	PC005	PC005-4"-VL-115-01HSS-N	
1"-HY-136-03HSS-N	FROM HYDROGEN STORAGE VESSEL V-25001F TO HYDROGEN STORAGE VESSELS HEADER (OUTLET)	PC005	PC005-1"-HY-136-03HSS-N	
1"-HY-190-03HSS-N	N2 CONNECTING LINE TO HYDROGEN STORAGE VESSEL V-25001F	PC005	PC005-1"-HY-190-03HSS-N	
1-1/2"-HY-148-03HSS-N	H2 COMMON OUTLET LINE FROM STORAGE VESSELS TO 25-SDV-023	PC005	PC005-1-1/2"-HY-148-03HSS-N	
1"-HY-144-03HSS-N	H2 COMMON OUTLET LINE FROM STORAGE VESSELS TO 25-BDV-022 (VENT LINE)	PC005	PC005-1"-HY-144-03HSS-N	
1"-VL-022-01HSS-N	H2 COMMON OUTLET LINE FROM STORAGE VESSELS VENT LINE	PC005	PC005-1"-VL-022-01HSS-N	
2"-HY-023-01HSS-N	FROM HYDROGEN STORAGE VESSEL HEADER (OUTLET) TO FUEL CELL PACKAGE A-80000	PC005	PC005-2"-HY-023-01HSS-N	
1"-HY-152-01HSS-N	INLET LINE OF FUEL CELL PACKAGE A-80000 TO 80-PSV-001 (VENT LINE)	PC005	PC005-1"-HY-152-01HSS-N	
2"-VL-010-01HSS-N	FUEL CELL PACKAGE A-80000 VENT LINE	PC005	PC005-2"-VL-010-01HSS-N	
1"-HY-163-01HSS-N	INLET LINE OF FUEL CELL PACKAGE A-80000 TO 80-XV-001 (VENT LINE)	PC005	PC005-1"-HY-163-01HSS-N	

TECHNICAL INTEGRITY VERIFICATION REPORT PC007-01-Rev.01

Client: **Crosswind**

Project: **HOLLANDSE KUST NOORD WIND PARK Project - Contract No. CW-I-WP4-2023-05**

Installation: **Base Load Power Hub (BLPH)**

SCE Performance Standard

Reference document: Safety Critical Elements (SCE) and Performance Standard Doc. No. 123A90-DDL-SAF-RE-30003 Rev.04

SCE Description: Relief System **SCE ID**: PC007

SCE TAG	DESCRIPTION	CODE
25-PSV-001A	PRESSURE SAFETY VALVE (FROM HYDROGEN STORAGE VESSEL V-25001A TO HYDROGEN VENT HEADER)	PC007-25-PSV-001A
25-PSV-001B	PRESSURE SAFETY VALVE (FROM HYDROGEN STORAGE VESSEL V-25001B TO HYDROGEN VENT HEADER)	PC007-25-PSV-001B
25-PSV-001C	PRESSURE SAFETY VALVE (FROM HYDROGEN STORAGE VESSEL V-25001C TO HYDROGEN VENT HEADER)	PC007-25-PSV-001C
25-PSV-001D	PRESSURE SAFETY VALVE (FROM HYDROGEN STORAGE VESSEL V-25001D TO HYDROGEN VENT HEADER)	PC007-25-PSV-001D
25-PSV-001E	PRESSURE SAFETY VALVE (FROM HYDROGEN STORAGE VESSEL V-25001E TO HYDROGEN VENT HEADER)	PC007-25-PSV-001E
25-PSV-001F	PRESSURE SAFETY VALVE (FROM HYDROGEN STORAGE VESSEL V-25001F TO HYDROGEN VENT HEADER)	PC007-25-PSV-001F
80-PSV-001	PRESSURE SAFETY VALVE (FROM HYDROGEN STORAGE VESSELS HEADER (OUTLET) TO HYDROGEN VENT HEADER)	PC007-80-PSV-001

SCE Boundaries: Protection system against overpressure (PSV)

SCE Functionality Criteria: To prevent uncontrolled loss of containment under extreme process conditions through service life

PHASE: Design / Procurement / Fabrication / Construction / Commissioning

Performance Standard: PC005-01

Criteria Description

The criteria selected for design, procurement, fabrication, construction, and commissioning are based on projects and safety technical standards, industry best practices, and regulatory requirements. These ensure the platform's safety, reliability, and compliance at every stage, focusing on quality, integrity, and performance across the project lifecycle.

Detailed criteria are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

Technical Integrity Verification Activities

Activity Details

Assurance is the processes that ensures a consistent meet of the performance criteria. It involves checks, audits, and monitoring to verify that operations remain within required parameters, identifying and mitigating risks to maintain safety and efficiency.

Detailed assurance activities are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

A = Activity closed, it has been demonstrated that the performance standard has been met.

B = Activity undertaken, comments outstanding performance standard has not been met.

B* = Activity is not in compliance with Performance Standard. A documented review of the technical solution has been completed by Duty Holder/Owner, and the review has concluded that the current solution is acceptable and has an equivalent level of safety. No further action is required by Verifier.

C = Activity cannot be completed, further information required, see comments below.

Phase	Assurance	Status
Design	Basic Design Engineering Package (loss of containment)	
	Basic Design Engineering Package (functional criteria)	
	Notified Body to verify and approve the design.	
	Company review and approval of the design documents are aligned with project requirements	
	Compliance to the material requisition by preparing a technical bid evaluation.	
	Company review and approval of the design documents by suitable qualified personnel according to EEHA	
Proc.	Verify that the material requisition and the technical bid evaluation are attached to the purchase order Supplier's Declaration of Conformity	
	Vendor's Declaration of Conformity to ATEX Vendor's ATEX EC Examination Certification	

TECHNICAL INTEGRITY VERIFICATION REPORT PC007-01-Rev.01

	Perform audits based on the criticality rating of the supply and new suppliers.	
Fabr.	Perform intervention points as per the approved ITP. Perform hydrotest and fugitive emission tests, and verify the related report	
	Verify the material certificates.	
	Stamp of nameplates and issuance of Declaration of Conformities.	
	Review and approve the Manufacturer Record Book, including calibration certificate validity.	
Const.	Ready For Commissioning Certificate issued	
	Recertification will be performed at an accredited laboratory (ISO 17025)	
	Verification of the Inspection test report	
Comm.	Attendance of the tests and verification of the reports.	

Tags

Rosetti has performed the above-listed verification activities, which apply to the piping portion of the platform.

Documents Reviewed

Document No.	Title	Rev.
1724000518-IN-LIS-00013	ATEX DOCUMENTATION	02
1724000518-QC-PRO-00006	FACTORY ACCEPTANCE TEST PROCEDURE including HYDROSTATIC TEST PROCEDURE - PRESSURE SAFETY VALVES	02
1724000518-QC-PRO-00014	FUGITIVE EMISSION PROCEDURE	02
1724000518-IN-DA-00003	GENERAL ARRANGEMENTS INCLUDING NAMEPLATE DRAWING - PRESSURE SAFETY VALVES	05
1724000518-QC-ITP-00002	INSPECTION AND TEST PLAN - PRESSURE SAFETY VALVES	03
1724000518-IN-MAN-00010	INSTALLATION, OPERATION AND MAINTENANCE MANUAL - PRESSURE SAFETY VALVES	03
1724000518-IN-DS-00004	INSTRUMENTS DATA SHEETS (INCLUDING SIZING CALCULATION SHEETS) - PRESSURE SAFETY VALVES	05
1724000518-QC-DB-00008	MANUFACTURERS RECORD BOOK (FINAL DOSSIER) - PRESSURE SAFETY VALVES	05
1724000518-QC-LIS-00009	MANUFACTURERS RECORD BOOK (FINAL DOSSIER) - INDEX - PRESSURE SAFETY VALVES	03
1724000518-NDT-PRO-00007	NON-DESTRUCTIVE EXAMINATIONS PROCEDURES (NDE) including PMI TEST PROCEDURE, NDE OPERATORS LIST and QUALIFICATIONS	02
1724000518-QC-PRO-00012	PACKING, HANDLING, SHIPPING, PRESERVATION AND STORAGE PROCEDURES - PRESSURE SAFETY VALVES	03
1724000518-COM-LIS-00011	SPARE PART INDEX REGISTER (COMMISSIONING, 2-YEARs OPERATION, CAPITAL) - PRESSURE SAFETY VALVES	02
1724000518-MD-LIS-00001	SUPPLIER MASTER INDEX REGISTER (SMIR) - PRESSURE SAFETY VALVES	01
1724000518-MAT-PRO-00005	SURFACE PREPARATION AND PAINTING PROCEDURE - PRESSURE SAFETY VALVES	02
1724000518-IN-LIS-00015	VENDOR ASSET AND TAG REGISTER	03
123A90-PML-PM-LIS-00036	ATEX REGISTER	00
123A90-PML-QHSE-PL-00119	ATEX IMPLEMENTATION PLAN	04

Outstanding Issues / Comments

NONE

Verification

There are no deviations from code, standards or specified requirements identified.

REV.	Date Issued	Issued by [PQM]	Verified by [PEM]	Approved by [PM]
00	11/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
01	26/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
02	15/05/2025	Raffaele Degli Esposti	Claudia Giunchi	Massimiliano Brunelli

TECHNICAL INTEGRITY VERIFICATION REPORT PS002-01-Rev.02

Client: **Crosswind**

Project: **HOLLANDSE KUST NOORD WIND PARK Project - Contract No. CW-I-WP4-2023-05**

Installation: **Base Load Power Hub (BLPH)**

SCE Performance Standard

Reference document: Safety Critical Elements (SCE) and Performance Standard Doc. No. 123A90-DDL-SAF-RE-30003 Rev.04

SCE Description: Fire and explosion protection **SCE ID**: PS002

SCE TAG	DESCRIPTION	SCE CODE
BLPH-DECK PLATING	BLPH-DECK PLATING	PS002-BLPH-DECK PLATING
BLPH-EXTINGUISHER	PORTABLE FIRE EXTINGUISHER	PS002-BLPH-EXTINGUISHER

SCE Boundaries: Deck plating / Fire Extinguisher **SCE Functionality Criteria**: To protect personnel and SCEs explosion effects by way of shielding

PHASE: Design / Procurement / Fabrication / Construction / Commissioning

Performance Standard: PS002-01

Criteria **Description**

The criteria selected for design, procurement, fabrication, construction, and commissioning are based on projects and safety technical standards, industry best practices, and regulatory requirements. These ensure the platform's safety, reliability, and compliance at every stage, focusing on quality, integrity, and performance across the project lifecycle.

Detailed criterias are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

Technical Integrity Verification Activities

Activity **Details**

Assurance is the processes that ensures a consistent meet of the performance criteria. It involves checks, audits, and monitoring to verify that operations remain within required parameters, identifying and mitigating risks to maintain safety and efficiency.

Detailed assurance activities are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

A = Activity closed, it has been demonstrated that the performance standard has been met.

B = Activity undertaken, comments outstanding performance standard has not been met.

B* = Activity is not in compliance with Performance Standard. A documented review of the technical solution has been completed by Duty Holder/Owner, and the review has concluded that the current solution is acceptable and has an equivalent level of safety. No further action is required by Verifier.

C = Activity cannot be completed, further information required, see comments below.

Phase	Assurance	Status
Design	Basic Design Engineering Package	
	Company Verify and approve the design.	
	Company review and approval of the design documents are aligned with project requirements	
Proc.	Verify that the material requisition and the technical bid evaluation are attached to the purchase order Suppliers Declaration of Conformity	
	Perform audits based on the criticality rating of the supply and new suppliers.	
Fabr.	See references in the Dependencies and Interaction section.	
Const.	Mechancial completion checks and compilation of related ITRs	
Comm.	N/A	

Tags

Rosetti has performed the above-listed verification activities, which apply to the platform

Documents Reviewed

Document No.	Title	Rev.
123A90-DDL-SAF-RE-30020	Fire and Explosion Risk Analys (FERA) report	04
123A90-DDL-SAF-DL-30025	Escape Routes, Fire Fighting, Life Saving Equipment and Safety Equipment Layouts Drawings	01
123A90-DDL-SAF-DL-30026	Escape Routes, Fire Fighting, Life Saving Equipment and Safety Equipment Layouts Drawings - upper deck	03

TECHNICAL INTEGRITY VERIFICATION REPORT PS002-01-Rev.02

Outstanding Issues / Comments

NONE

Verification

There are no deviations from code, standards or specified requirements identified.

REV.	Date Issued	Issued by [PQM]	Verified by [PEM]	Approved by [PM]
00	11/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
01	26/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
02	15/05/2025	Raffaele Degli Esposti	Claudia Giunchi	Massimiliano Brunelli

TECHNICAL INTEGRITY VERIFICATION REPORT PS015-01-Rev.02

Client: **Crosswind**

Project: **HOLLANDSE KUST NOORD WIND PARK Project - Contract No. CW-I-WP4-2023-05**

Installation: **Base Load Power Hub (BLPH)**

SCE Performance Standard

Reference document: Safety Critical Elements (SCE) and Performance Standard Doc. No. 123A90-DDL-SAF-RE-30003 Rev.04

SCE Description: Collision avoidance system **SCE ID**: PS015

SCE TAG	DESCRIPTION	SCE CODE
BLPH-RACON	RADAR TRASPONDIND BEACON (RACON)	PS015-BLPH-RACON
BLPH-NAV AIDS	VISUAL NAVIGATION AIDS	PS015-BLPH-NAV AIDS
BLPH-MARINE LIGHTS	MARINE LIGHTS & OBSTRUCTION LIGHTS	PS015-BLPH-MARINE LIGHTS
BLPH-AERO AIS	AUTOMATIC IDENTIFICATION SYSTEM (AIS)	PS015-BLPH-AERO AIS

SCE Boundaries: Collision avoidance system: radar transponding beacon, visual navigation aids, marine acoustic aids

SCE Functionality Criteria: To alert marine vessels of the position of the installation, taking enough time to avoid the area and preventing any collision

PHASE: Design / Procurement / Fabrication / Construction / Commissioning

Performance Standard: PS015-01

Criteria Description

The criteria selected for design, procurement, fabrication, construction, and commissioning are based on projects and safety technical standards, industry best practices, and regulatory requirements. These ensure the platform's safety, reliability, and compliance at every stage, focusing on quality, integrity, and performance across the project lifecycle.

Detailed criterias are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

Technical Integrity Verification Activities

Activity Details

Assurance is the processes that ensures a consistent meet of the performance criteria. It involves checks, audits, and monitoring to verify that operations remain within required parameters, identifying and mitigating risks to maintain safety and efficiency.

Detailed assurance activities are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

A = Activity closed, it has been demonstrated that the performance standard has been met.

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B* = Activity is not in compliance with Performance Standard. A documented review of the technical solution has been completed by Duty Holder/Owner, and the review has concluded that the current solution is acceptable and has an equivalent level of safety. No further action is required by Verifier.

C = Activity cannot be completed, further information required, see comments below.

Phase	Assurance	Status
Design	Basic Design Engineering Package	
	Collision Avoidance Systems shall have an uninterruptible power supply that allows continued operation	
	Company Verify and approve the design.	
	Company review and approval of the design documents are aligned with project requirements	
Proc.	Verify that the material requisition and the technical bid evaluation are attached to the purchase order Suppliers Declaration of Conformity	
	Vendor's Declaration of Conformity to ATEX / Vendor's ATEX EC Examination Certification	
	Perform audits based on the criticality rating of the supply and new suppliers.	
Fabr.	Witnessing of the Factory Acceptance test by suitable qualified inspector	
	Review and approve Manufacturer Record Book	
Const.	Mechancial completion checks and compilation of related ITRs	
Comm.	Witnessing of the Site Acceptance test by suitable qualified inspector and issuance of commissioning reports	

Tags

Rosetti has performed the above-listed verification activities, which apply to the platform

TECHNICAL INTEGRITY VERIFICATION REPORT PS015-01-Rev.02

Documents Reviewed

Document No.	Title	Rev.
123A90-DDL-EL-SP-20087	Technical Specification, IDS and DDS for Navigation Aid System	03
123A90-DDL-EL-MR-20086	MR - for Navigation Aid System	01
123A90-DDL-EL-DS-20088	TDS - Navigation Aid System	03
123A90-DDL-EL-DL-20139	Navigation Aid System General Layouts	02

Outstanding Issues / Comments

NONE

Verification

There are no deviations from code, standards or specified requirements identified.

REV.	Date Issued	Issued by [PQM]	Verified by [PEM]	Approved by [PM]
00	11/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
01	26/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
02	15/05/2025	Raffaele Degli Esposti	Claudia Giunchi	Massimiliano Brunelli

TECHNICAL INTEGRITY VERIFICATION REPORT SD001-01- Rev.02

Client: **Crosswind**

Project: **HOLLANDSE KUST NOORD WIND PARK Project - Contract No. CW-I-WP4-2023-05**

Installation: **Base Load Power Hub (BLPH)**

SCE Performance Standard

Reference document: Safety Critical Elements (SCE) and Performance Standard Doc. No. 123A90-DDL-SAF-RE-30003 Rev.04

SCE Description: Emergency shutdown system (ESD) **SCE ID**: SD001

SCE TAG	DESCRIPTION	SCE CODE
Refer to the attached table	Refer to the attached table	Refer to the attached table

SCE Boundaries: Safety control loop including the transmitter with sensor for parameter (pressure, temperature, level) and logic solver (interlock, analogical or digital input/output modules, interposing relay, pulse barrier)

SCE Functionality Criteria: To ensure platform shutdown in safe conditions

PHASE: Design / Procurement / Fabrication / Construction / Commissioning

Performance Standard: SD001-01

Criteria Description

The criteria selected for design, procurement, fabrication, construction, and commissioning are based on projects and safety technical standards, industry best practices, and regulatory requirements. These ensure the platform's safety, reliability, and compliance at every stage, focusing on quality, integrity, and performance across the project lifecycle.

Detailed criterias are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

Technical Integrity Verification Activities

Activity Details

Assurance is the processes that ensures a consistent meet of the performance criteria. It involves checks, audits, and monitoring to verify that operations remain within required parameters, identifying and mitigating risks to maintain safety and efficiency.

Detailed assurance activities are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

A = Activity closed, it has been demonstrated that the performance standard has been met.

B = Activity undertaken, comments outstanding performance standard has not been met.

B* = Activity is not in compliance with Performance Standard. A documented review of the technical solution has been completed by Duty Holder/Owner, and the review has concluded that the current solution is acceptable and has an equivalent level of safety. No further action is required by Verifier.

C = Activity cannot be completed, further information required, see comments below.

Phase	Assurance	Status
Design	Basic Design Engineering Package	
	Company Verify and approve the design.	
	Company review and approval of the design documents are aligned with project requirements	
Proc.	Verify that the material requisition and the technical bid evaluation are attached to the purchase order Suppliers Declaration of Conformity	
	Perform audits based on the criticality rating of the supply and new suppliers.	
Fabr.	N/A	
Const.	Mechancial completion checks and compilation of related ITRs	
Comm.	Witnessing of the Site Acceptance test by suitable qualified inspector and issuance of commissioning reports	

TECHNICAL INTEGRITY VERIFICATION REPORT SD001-01- Rev.02

Documents Reviewed

Document No.	Title	Rev.
1724000204-IN-CA-00003	ACTUATOR SIZING AND TORQUE TABLE	05
1724000204-MAT-PRO-00008	ACTUATOR SURFACE PREPARATION AND PAINTING PROCEDURES	02
1724000204-IN-LIS-00013	ATEX REGISTER	02
1724000204-QC-PRO-00010	FACTORY ACCEPTANCE TEST PROCEDURE AND REPORT	01
1724000204-QC-ITP-00002	INSPECTION AND TEST PLAN	02
1724000204-IN-DS-00007	INSTRUMENT AND VALVES DATA SHEETS	01
1724000204-IN-DG-00006	PNEUMATIC DIAGRAM and WIRING	03
1724000204-QC-PRO-00016	PREPARATION FOR SHIPPING WITH HANDLING AND STORAGE PROCEDURES	00
1724000204-QC-LIS-00012	SDV - BDV AND TIGHT SHUT-OFF XV VALVES - MANUFACTURERS RECORD BOOK (FINAL DOSSIER) - INDEX	01
1724000204-IN-MAN-00014	SDV - BDV AND TIGHT SHUT-OFF XV VALVES - TECHNICAL OPERATING AND MAINTENANCE MANUAL – COMPLETE	01
1724000204-QC-DB-00011	SDV- BDV AND TIGHT SHUT-OFF XV VALVES - MANUFACTURERS RECORD BOOK (FINAL DOSSIER)	00
1724000204-COM-LIS-00015	SPARE PART AND SPECIAL TOOLS INDEX REGISTER (COMMISSIONING, 2-YEARs OPERATION)	01
1724000204-MD-LIS-00001	SUPPLIER MASTER INDEX REGISTER (SMIR)	02
1724000204-IN-DA-00004	VALVE, ACTUATOR AND ASSEMBLY GENERAL ARRANGEMENTS DRAWING AND NAMEPLATE DRAWING	04
1724000204-MAT-PRO-00009	VALVES SURFACE PREPARATION AND PAINTING PROCEDURES	02

Tags

Rosetti has performed the above-listed verification activities, which apply to the platform

Outstanding Issues / Comments

NONE

Verification

There are no deviations from code, standards or specified requirements identified.

REV.	Date Issued	Issued by [PQM]	Verified by [PEM]	Approved by [PM]
00	11/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
01	26/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
02	15/05/2025	Raffaele Degli Esposti	Claudia Giunchi	Massimiliano Brunelli

SD001 EMERGENCY SHUTDOWN SYSTEM				
25-PT-002	25-PT-002 LOCATED ON COMMON LINE TO STORAGE VESSELS	SD001	SD001-25-PT-002	
25-PT-004	25-PT-004 LOCATED ON STORAGE VESSEL V-25001A	SD001	SD001-25-PT-004	
25-PT-006	25-PT-006 LOCATED ON STORAGE VESSEL V-25001B	SD001	SD001-25-PT-006	
25-PT-008	25-PT-008 LOCATED ON STORAGE VESSEL V-25001C	SD001	SD001-25-PT-008	
25-PT-009	25-PT-009 LOCATED ON STORAGE VESSEL V-25001D	SD001	SD001-25-PT-009	
25-PT-011	25-PT-011 LOCATED ON STORAGE VESSEL V-25001E	SD001	SD001-25-PT-011	
25-PT-012	25-PT-012 LOCATED ON STORAGE VESSEL V-25001F	SD001	SD001-25-PT-012	
80-PT-002	80-PT-002 LOCATED ON COMMON LINE TO FUEL CELL PACKAGE	SD001	SD001-80-PT-002	
950ESD-01101	ESD-1 PUSH BUTTON, EXTERNAL AREA OF FUEL CELL, UPPER DECK	SD001	SD001-950ESD-01101	
950ESDD-01101	ESD-1D PUSH BUTTON, EXTERNAL AREA OF FUEL CELL, UPPER DECK	SD001	SD001-950ESDD-01101	
950ESD-03101	ESD-1 PUSH BUTTON, EXTERNAL AREA OF UV WATER FILTER, UPPER DECK	SD001	SD001-950ESD-03101	
950ESDD-03101	ESD-1D PUSH BUTTON, EXTERNAL AREA OF UV WATER FILTER, UPPER DECK	SD001	SD001-950ESDD-03101	
950ESD-06101	ESD-1 PUSH BUTTON, EXTERNAL AREA OF B-100 HV/MV SWITCHROOM, LOWER DECK	SD001	SD001-950ESD-06101	
950ESDD-06101	ESD-1D PUSH BUTTON, EXTERNAL AREA OF B-100 HV/MV SWITCHROOM, LOWER DECK	SD001	SD001-950ESDD-06101	
950ESD-04101	ESD-1 PUSH BUTTON, EXTERNAL AREA OF B-400 I&T ROOM, LOWER DECK	SD001	SD001-950ESD-04101	
950ESDD-04101	ESD-1D PUSH BUTTON, EXTERNAL AREA OF B-400 I&T ROOM, LOWER DECK	SD001	SD001-950ESDD-04101	
950ESD-07101	ESD-1 PUSH BUTTON, WASTE WATER TANK AREA, EXISTING PLATFORM	SD001	SD001-950ESD-07101	
950ESDD-07101	ESD-1D PUSH BUTTON, WASTE WATER TANK AREA, EXISTING PLATFORM	SD001	SD001-950ESDD-07101	

TECHNICAL INTEGRITY VERIFICATION REPORT SD002-01-Rev.02

Client: **Crosswind**

Project: **HOLLANDSE KUST NOORD WIND PARK Project - Contract No. CW-I-WP4-2023-05**

Installation: **Base Load Power Hub (BLPH)**

SCE Performance Standard

Reference document: Safety Critical Elements (SCE) and Performance Standard — Doc. No. 123A90-DDL-SAF-RE-30003 Rev.04

SCE Description: Blowdown Valves (BDV) **SCE ID**: SD002

SCE TAG	DESCRIPTION	SCE CODE
25-BDV-003	BLOWDOWN VALVE (FROM STORAGE INLET LINE TO HYDROGEN VENT HEADER)	SD002-25-BDV-003
25-BDV-005	BLOWDOWN VALVE (FROM HYDROGEN STORAGE VESSEL V-25001A TO HYDROGEN VENT HEADER)	SD002-25-BDV-005
25-BDV-007	BLOWDOWN VALVE (FROM HYDROGEN STORAGE VESSEL V-25001B TO HYDROGEN VENT HEADER)	SD002-25-BDV-007
25-BDV-010	BLOWDOWN VALVE (FROM HYDROGEN STORAGE VESSEL V-25001C TO HYDROGEN VENT HEADER)	SD002-25-BDV-010
25-BDV-013	BLOWDOWN VALVE (FROM HYDROGEN STORAGE VESSEL V-25001D TO HYDROGEN VENT HEADER)	SD002-25-BDV-013
25-BDV-016	BLOWDOWN VALVE (FROM HYDROGEN STORAGE VESSEL V-25001E TO HYDROGEN VENT HEADER)	SD002-25-BDV-016
25-BDV-019	BLOWDOWN VALVE (FROM HYDROGEN STORAGE VESSEL V-25001F TO HYDROGEN VENT HEADER)	SD002-25-BDV-019
25-BDV-022	BLOWDOWN VALVE (MAIN LINE FROM HYDROGEN STORAGE VESSELS TO HYDROGEN VENT HEADER)	SD002-25-BDV-022

SCE Boundaries: Blowdown Valves **SCE Functionality Criteria**: To prevent escalation during a major accident event ensuring a rapid reduction in the size of inventory

PHASE: Design / Procurement / Fabrication / Construction / Commissioning

Performance Standard: SD002-01

Criteria **Description**

The criteria selected for design, procurement, fabrication, construction, and commissioning are based on projects and safety technical standards, industry best practices, and regulatory requirements. These ensure the platform's safety, reliability, and compliance at every stage, focusing on quality, integrity, and performance across the project lifecycle.

Detailed criterias are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

Technical Integrity Verification Activities

Activity **Details**

Assurance is the processes that ensures a consistent meet of the performance criteria. It involves checks, audits, and monitoring to verify that operations remain within required parameters, identifying and mitigating risks to maintain safety and efficiency.

Detailed assurance activities are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

A = Activity closed, it has been demonstrated that the performance standard has been met.

B = Activity undertaken, comments outstanding performance standard has not been met.

B* = Activity is not in compliance with Performance Standard. A documented review of the technical solution has been completed by Duty Holder/Owner, and the review has concluded that the current solution is acceptable and has an equivalent level of safety. No further action is required by Verifier.

C = Activity cannot be completed, further information required, see comments below.

Phase	Assurance	Status
Design	Basic Design Engineering Package	
	Company Verify and approve the design.	
	Company review and approval of the design documents are aligned with project requirements	
Proc.	Verify that the material requisition and the technical bid evaluation are attached to the purchase order Suppliers Declaration of Conformity	
	Perform audits based on the criticality rating of the supply and new suppliers.	
Fabr.	N/A	
Const.	Mechancial completion checks and compilation of related ITRs	
Comm.	Witnessing of the Site Acceptance test by suitable qualified inspector and issuance of commissioning reports	

Tags

Rosetti has performed the above-listed verification activities, which apply to the platform

TECHNICAL INTEGRITY VERIFICATION REPORT SD002-01-Rev.02

Documents Reviewed

Document No.	Title	Rev.
1724000204-IN-CA-00003	ACTUATOR SIZING AND TORQUE TABLE	05
1724000204-MAT-PRO-00008	ACTUATOR SURFACE PREPARATION AND PAINTING PROCEDURES	02
1724000204-IN-LIS-00013	ATEX REGISTER	02
1724000204-QC-PRO-00010	FACTORY ACCEPTANCE TEST PROCEDURE AND REPORT	01
1724000204-QC-ITP-00002	INSPECTION AND TEST PLAN	02
1724000204-IN-DS-00007	INSTRUMENT AND VALVES DATA SHEETS	01
1724000204-IN-DG-00006	PNEUMATIC DIAGRAM and WIRING	03
1724000204-QC-PRO-00016	PREPARATION FOR SHIPPING WITH HANDLING AND STORAGE PROCEDURES	00
1724000204-QC-LIS-00012	SDV - BDV AND TIGHT SHUT-OFF XV VALVES - MANUFACTURERS RECORD BOOK (FINAL DOSSIER) - INDEX	01
1724000204-IN-MAN-00014	SDV - BDV AND TIGHT SHUT-OFF XV VALVES - TECHNICAL OPERATING AND MAINTENANCE MANUAL – COMPLETE	01
1724000204-QC-DB-00011	SDV- BDV AND TIGHT SHUT-OFF XV VALVES - MANUFACTURERS RECORD BOOK (FINAL DOSSIER)	00
1724000204-COM-LIS-00015	SPARE PART AND SPECIAL TOOLS INDEX REGISTER (COMMISSIONING, 2-YEARs OPERATION)	01
1724000204-MD-LIS-00001	SUPPLIER MASTER INDEX REGISTER (SMIR)	02
1724000204-IN-DA-00004	VALVE, ACTUATOR AND ASSEMBLY GENERAL ARRANGEMENTS DRAWING AND NAMEPLATE DRAWING	04
1724000204-MAT-PRO-00009	VALVES SURFACE PREPARATION AND PAINTING PROCEDURES	02

Outstanding Issues / Comments

Verification

There are no deviations from code, standards or specified requirements identified.

REV.	Date Issued	Issued by [PQM]	Verified by [PEM]	Approved by [PM]
00	11/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
01	26/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
02	15/05/2025	Raffaele Degli Esposti	Claudia Giunchi	Massimiliano Brunelli

TECHNICAL INTEGRITY VERIFICATION REPORT SD006-01-Rev.02

Client: **Crosswind**

Project: **HOLLANDSE KUST NOORD WIND PARK Project - Contract No. CW-I-WP4-2023-05**

Installation: **Base Load Power Hub (BLPH)**

SCE Performance Standard

Reference document: Safety Critical Elements (SCE) and Performance Standard Doc. No. 123A90-DDL-SAF-RE-30003 Rev.04

SCE Description: Emergency Shutdown Valves (SDV) **SCE ID**: SD006

SCE TAG	DESCRIPTION	SCE CODE
25-SDV-001	SHUTDOWN VALVE (MAIN LINE FROM ELECTROLYSER PACKAGE A-20000 TO HYDROGEN VESSELS)	SD006-25-SDV-001
25-SDV-023	SHUTDOWN VALVE (MAIN LINE FROM HYDROGEN STORAGE VESSELS TO FUEL CELL PACKAGE)	SD006-25-SDV-023

SCE Boundaries: Emergency Shutdown Valves (SDV) **SCE Functionality Criteria**: To ensure platform shutdown in safe conditions

PHASE: Design / Procurement / Fabrication / Construction / Commissioning

Performance Standard: SD006-01

Criteria Description

The criteria selected for design, procurement, fabrication, construction, and commissioning are based on projects and safety technical standards, industry best practices, and regulatory requirements. These ensure the platform's safety, reliability, and compliance at every stage, focusing on quality, integrity, and performance across the project lifecycle.

Detailed criterias are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

Technical Integrity Verification Activities

Activity Details

Assurance is the processes that ensures a consistent meet of the performance criteria. It involves checks, audits, and monitoring to verify that operations remain within required parameters, identifying and mitigating risks to maintain safety and efficiency.

Detailed assurance activities are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

A = Activity closed, it has been demonstrated that the performance standard has been met.

B = Activity undertaken, comments outstanding performance standard has not been met.

B* = Activity is not in compliance with Performance Standard. A documented review of the technical solution has been completed by Duty Holder/Owner, and the review has concluded that the current solution is acceptable and has an equivalent level of safety. No further action is required by Verifier.

C = Activity cannot be completed, further information required, see comments below.

Phase	Assurance	Status
Design	Review P&IDs and Cause & Effect Diagrams in conjunction with HAZOP Reports to confirm that shutdown valve is sized correctly	
	Basic Design Engineering Package	
	Notified Body to verify and approve the design (Only for Cat.III)	
	Company review and approval of the design documents are aligned with project requirements	
	Compliance to the material requisition by preparing a technical bid evaluation.	
Proc.	Verify that the material requisition and the technical bid evaluation are attached to the purchase order Suppliers Declaration of Conformity	
	Perform audits based on the criticality rating of the supply and new suppliers.	
Fabr.	Perform intervention points as per approved ITP and test packs. Attendance of pressure testing by No.Bo	
	Verify the material certificates.	
	Review and approve Manufacturer Record Book (shop fabrication related)	
Const.	Ready For Commissioning Certificate issued	
	Issuance of RFCC (ready for commissioning certificate)	
	Review and approve Manufacturer Record Book (constuction related)	
Comm.	Witnessing of the Site Acceptance test by suitable qualified inspector and issuance of commissioning reports	

TECHNICAL INTEGRITY VERIFICATION REPORT SD006-01-Rev.02

Tags

Rosetti has performed the above-listed verification activities, which apply to the platform

Documents Reviewed

Document No.	Title	Rev.
1724000204-IN-CA-00003	ACTUATOR SIZING AND TORQUE TABLE	05
1724000204-MAT-PRO-00008	ACTUATOR SURFACE PREPARATION AND PAINTING PROCEDURES	02
1724000204-IN-LIS-00013	ATEX REGISTER	02
1724000204-QC-PRO-00010	FACTORY ACCEPTANCE TEST PROCEDURE AND REPORT	01
1724000204-QC-ITP-00002	INSPECTION AND TEST PLAN	02
1724000204-IN-DS-00007	INSTRUMENT AND VALVES DATA SHEETS	01
1724000204-IN-DG-00006	PNEUMATIC DIAGRAM and WIRING	03
1724000204-QC-PRO-00016	PREPARATION FOR SHIPPING WITH HANDLING AND STORAGE PROCEDURES	00
1724000204-QC-LIS-00012	SDV - BDV AND TIGHT SHUT-OFF XV VALVES - MANUFACTURERS RECORD BOOK (FINAL DOSSIER) - INDEX	01
1724000204-IN-MAN-00014	SDV - BDV AND TIGHT SHUT-OFF XV VALVES - TECHNICAL OPERATING AND MAINTENANCE MANUAL – COMPLETE	01
1724000204-QC-DB-00011	SDV- BDV AND TIGHT SHUT-OFF XV VALVES - MANUFACTURERS RECORD BOOK (FINAL DOSSIER)	00
1724000204-COM-LIS-00015	SPARE PART AND SPECIAL TOOLS INDEX REGISTER (COMMISSIONING, 2-YEARs OPERATION)	01
1724000204-MD-LIS-00001	SUPPLIER MASTER INDEX REGISTER (SMIR)	02
1724000204-IN-DA-00004	VALVE, ACTUATOR AND ASSEMBLY GENERAL ARRANGEMENTS DRAWING AND NAMEPLATE DRAWING	04
1724000204-MAT-PRO-00009	VALVES SURFACE PREPARATION AND PAINTING PROCEDURES	02

Outstanding Issues / Comments

NONE

Verification

There are no deviations from code, standards or specified requirements identified.

REV.	Date Issued	Issued by [PQM]	Verified by [PEM]	Approved by [PM]
00	11/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
01	26/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
02	15/05/2025	Raffaele Degli Esposti	Claudia Giunchi	Massimiliano Brunelli

TECHNICAL INTEGRITY VERIFICATION REPORT SD009-01-Rev.02

Client: **Crosswind**

Project: **HOLLANDSE KUST NOORD WIND PARK Project - Contract No. CW-I-WP4-2023-05**

Installation: **Base Load Power Hub (BLPH)**

SCE Performance Standard

Reference document: Safety Critical Elements (SCE) and Performance Standard Doc. No. 123A90-DDL-SAF-RE-30003 Rev.04

SCE Description: Utility Air **SCE ID**: SD009

SCE TAG	DESCRIPTION	SCE CODE
K-63001A	INSTRUMENT AIR COMPRESSOR / MOTOR (INSIDE INSTRUMENT AIR PACKAGE A-63000)	SD006-K-63001A
K-63001B	INSTRUMENT AIR COMPRESSOR / MOTOR (INSIDE INSTRUMENT AIR PACKAGE A-63000)	SD006-K-63001B
63-PT-064	63-PT-064 LOCATED ON INSTRUMENT AIR RECIEVER V-63001 (INSIDE INSTRUMENT AIR PACKAGE A-63000)	SD006-63-PT-064
63-PT-004	63-PT-004 LOCATED ON INSTRUMENT AIR HEADER	SD006-63-PT-004

SCE Boundaries: Instrument Air **SCE Functionality Criteria**: To prevent an unplanned and/or out of sequence operation of safety critical air-controlled equipment, such as emergency shutdown valves

PHASE: Design / Procurement / Fabrication / Construction / Commissioning

Performance Standard: SD009-01

Criteria Description

The criteria selected for design, procurement, fabrication, construction, and commissioning are based on projects and safety technical standards, industry best practices, and regulatory requirements. These ensure the platform's safety, reliability, and compliance at every stage, focusing on quality, integrity, and performance across the project lifecycle.

Detailed criterias are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

Technical Integrity Verification Activities

Activity Details

Assurance is the processes that ensures a consistent meet of the performance criteria. It involves checks, audits, and monitoring to verify that operations remain within required parameters, identifying and mitigating risks to maintain safety and efficiency.

Detailed assurance activities are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

A = Activity closed, it has been demonstrated that the performance standard has been met.

B = Activity undertaken, comments outstanding performance standard has not been met.

B* = Activity is not in compliance with Performance Standard. A documented review of the technical solution has been completed by Duty Holder/Owner, and the review has concluded that the current solution is acceptable and has an equivalent level of safety. No further action is required by Verifier.

C = Activity cannot be completed, further information required, see comments below.

Phase	Assurance	Status
Design	Basic Design Engineering Package	
	Notified Body to verify and approve the design (Only for Cat.III piping)	
	Company review and approval of the design documents are aligned with project requirements	
	Compliance to the material requisition by preparing a technical bid evaluation.	
	Perform cross check verification against P&Ids and Line List	
Proc.	Verify that the material requisition and the technical bid evaluation are attached to the purchase order Suppliers Declaration of Conformity	
	Perform audits based on the criticality rating of the supply and new suppliers.	
Fabr.	Perform intervention points as per approved ITP and test packs. Attendance of pressure testing by No.Bo for Cat. II (10%) III (100%) lines	
	Verify the material certificates.	
	Verification of approved DR and fabrication.	
	Review and approve Manufacturer Record Book (shop fabrication related)	
Const.	Ready For Commissioning Certificate issued	
	Verification of test packs and attendance of pressure testing by No.Bo for Cat. II (10%) III (100%) lines.	

	Issuance of RFCC (ready for commissioning certificate)	
	Review and approve Manufacturer Record Book (constuction related)	
Comm.	Attendance of the tests and verification of the reports.	

Tags

Rosetti has performed the above-listed verification activities, which apply to the platform

Documents Reviewed

Document No.	Title	Rev.
123A90-DDL-PR-UFD-80006	BLPH UTILITY FLOW DIAGRAM WATER TREATMENT PLANT	03
123A90-DDL-PR-UFD-80007	BLPH UTILITY FLOW DIAGRAM INSTRUMENT AIR AND NITROGEN SYSTEMS	03
123A90-DDL-PR-UFD-80008	BLPH UTILITY FLOW DIAGRAM VENT SYSTEMS	03
123A90-DDL-PR-RE-80037	Chemicals / Utility Consumption report	02

Outstanding Issues / Comments

NONE

Verification

There are no deviations from code, standards or specified requirements identified.

REV.	Date Issued	Issued by [PQM]	Verified by [PEM]	Approved by [PM]
00	11/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
01	26/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
02	15/05/2025	Raffaele Degli Esposti	Claudia Giunchi	Massimiliano Brunelli

TECHNICAL INTEGRITY VERIFICATION REPORT SI002-01-Rev.02

Client: **Crosswind**

Project: **HOLLANDSE KUST NOORD WIND PARK Project - Contract No. CW-I-WP4-2023-05**

Installation: **Base Load Power Hub (BLPH)**

SCE Performance Standard

Reference document: Safety Critical Elements (SCE) and Performance Standard Doc. No. 123A90-DDL-SAF-RE-30003 Rev.04

SCE Description: Topside Structure **SCE ID: SI002**

SCE TAG	DESCRIPTION	SCE CODE
BLPH-TOPSIDE	BLPH TOPSIDE AND PRIMARY STRUCTURE	SI002-BLPH-TOPSIDE

SCE Boundaries: Platform Structural Elements

SCE Functionality Criteria: Ensure platform structural integrity through the design life of the facility

PHASE: Design / Procurement / Fabrication / Construction / Commissioning

Performance Standard: SI002-01

Criteria

The criteria selected for design, procurement, fabrication, construction, and commissioning are based on projects and safety technical standards, industry best practices, and regulatory requirements. These ensure the platform's safety, reliability, and compliance at every stage, focusing on quality, integrity, and performance across the project lifecycle.

Detailed criteria's are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

Technical Integrity Verification Activities

Activity Details

Assurance is the processes that ensures a consistent meet of the performance criteria. It involves checks, audits, and monitoring to verify that operations remain within required parameters, identifying and mitigating risks to maintain safety and efficiency.

Detailed assurance activities are as listed in the Performance Standard Collection 123A90-DDL-MD-LIS-01010 Rev.00

A = Activity closed, it has been demonstrated that the performance standard has been met.

B = Activity undertaken, comments outstanding performance standard has not been met.

B* = Activity is not in compliance with Performance Standard. A documented review of the technical solution has been completed by Duty Holder/Owner, and the review has concluded that the current solution is acceptable and has an equivalent level of safety. No further action is required by Verifier.

C = Activity cannot be completed, further information required, see comments below.

Phase	Assurance	Status
Design	Basic Design Engineering Package (Design Life)	
	Basic Design Engineering Package (Fatigue Loads)	
	Notified Body (DNV) to verify and approve the design. Issuance of design IRC. (BDEP & DEM1)	
	Notified Body (DNV) to verify and approve the design. Issuance of design IRC. (Specific Requirement)	
	Notified Body (DNV) to verify and approve the design. Issuance of design IRC. (Material Selection Plan)	
	Verification of painting specification and procedure according to NORSOK Std. (Corrosion and Erosion)	
Proc.	Verify that the material requisition and the technical bid evaluation are attached to the purchase order	
	Perform audits based on the criticality rating of the supply and new suppliers.	
Fabr.	Perform intervention points as per approved ITP. Internal audits performed on key activities.	
	Verify the material certificates.	
	Review and approve Manufacturer Record Book	
Constr.	Verification of the Inspection test report	

Tags

Rosetti has performed the above-listed verification activities, which apply to the structural portion of the platform.

Documents Reviewed

Document No.	Title	Rev.
123A90-FDL-ST-DD-90000	TOPSIDE - PRIMARY PLAN AT EL. +23310	01
123A90-FDL-ST-DD-90049	TOPSIDE - NODE PLAN AT EL. +23310	00
123A90-FDL-ST-DD-90136	TOPSIDE - PRIMARY PLAN AT EL. +30310	01
123A90-FDL-ST-DD-90067	TOPSIDE - SECONDARY PLAN AT EL. +23310	02

TECHNICAL INTEGRITY VERIFICATION REPORT SI002-01-Rev.02

Documents Reviewed

Document No.	Title	Rev.
123A90-FDL-ST-DD-90092	TOPSIDE - SECONDARY PLAN AT EL. +30310	03
123A90-FDL-ST-DD-90173	TOPSIDE - TERTIARY PLAN AT EL. +30310	02
123A90-DDL-ST-RE-90005	BLPH PLATFORM - JOINT CHECK DESIGN REPORT	02
123A90-DDL-ST-RE-90006	BLPH PLATFORM - SECONDARY STRUCTURES DESIGN REPORT	01
123A90-DDL-ST-RE-90012	TP - JOINT CHECK DESIGN REPORT	02
123A90-DDL-ST-SP-90017	STRUCTURAL DESIGN BASIS	04
123A90-DDL-MO-RE-91023	Basis of Design for Installation	00
123A90-PML-PM-PL-00003	Schedule of Design Reviews, Studies and Workshops	00
123A90-PML-PM-PRO-00082	Detail Design and Shop Drawing Site Modification Procedure (Red Line Mark-Up)	01

Outstanding Issues / Comments

NONE

Verification

There are no deviations from code, standards or specified requirements identified.

REV.	Date Issued	Issued by [PQM]	Verified by [PEM]	Approved by [PM]
00	11/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
01	26/03/2025	J.Mario Patanè	Claudia Giunchi	Massimiliano Brunelli
02	15/05/2025	Raffaele Degli Esposti	Claudia Giunchi	Massimiliano Brunelli